



## Management of arrhythmias in patients with chronic kidney disease on hemodialysis

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### ABSTRACT

Hemodialysis is an effective treatment that helps control blood pressure and compensate for important minerals in the bloodstream of a patient diagnosed with chronic kidney disease; However, this population group also denotes its significant vulnerability to developing certain cardiovascular complications such as cardiac arrhythmias, which not only condition the success of the procedure, but can also put the individual's survival at risk.

**Objective:** To describe the current management based on scientific evidence of arrhythmias in patients with chronic kidney disease on hemodialysis.

**Methodology:** This bibliographical review contemplates a search, analysis and synthesis process of different theoretical foundations, obtained from duly validated scientific information sources, which provide reliable support to achieve the established objectives.

**Results:** Ventricular and supraventricular arrhythmias are frequent disorders that appear in hemodialysis. The management of these conditions addresses continuous monitoring, synchronized electrical cardioversion, administration of calcium antagonists, anticoagulants, warfarin, amiodarone, acetylsalicylic acid and other antiarrhythmic drugs such as lidocaine and procainamide.

**Conclusion:** Among the oral anticoagulants that are most frequently used to prevent such events are vitamin K antagonists (VKAs), such as warfarin, and those that are not antagonists or opposed to vitamin K (NOACs), such as apixaban, Dabigatran, Edoxaban and Rivaroxaban.

**Keywords:** *Chronic kidney disease; Hemodialysis; arrhythmias; Oral anticoagulants; Driving*

### INTRODUCTION

The health of the human being is a state of full well-being that contemplates the balance of the physical, mental and psychosocial dimension, which allows the organism of an individual, regardless of their sex or chronological age, to fulfill their vital functions efficiently. (1)(2). Among the diseases with significant incidence denotes precisely chronic kidney disease (CKD), which is referred to by Nieto et al. (3).

As a condition that entails the slow, progressive and irreversible deterioration of the function of the kidneys, that is, these components lose the ability to eliminate waste and excess water that occurs in the anatomy of an individual. According to the World Health Organization (WHO), the clinical manifestations involved in the development of chronic kidney disease can appear slowly and progressively;

Similarly, kidney damage progresses gradually, including episodes such as loss of appetite, nausea, body weakness, insomnia, variation in the frequency and amount of urination, decreased mental acuity, drowsiness, swelling of feet, muscle cramps and high blood pressure. In addition to this, it should be mentioned that patients do not always present all the symptoms referred to above, since in some cases it is a consequence of the suffering of other diseases (4).

Currently, CKD is characterized by the high cost of living of patients and the high rate of morbidity and mortality, which is why it is considered a public health problem and represents a significant burden on their family environment, society and the health system. Worldwide, according to the data presented in the report promoted by Cerón & Sánchez (5), in the last decade there was an incidence level that borders 7.2% of individuals aged between 30 and 60 years. A large part of this population group were diagnosed after receiving primary care in cases of chronic conditions such as diabetes mellitus (DM) and / or arterial hypertension (HTN), being pathologies that are part of the risk factors associated with CKD and increase the probability that an individual manages to develop it up to 40%.

At the Latin American level, according to the report of the Latin American Society of Nephrology and Hypertension (SLNH), during the last five years, the prevalence of patients with chronic kidney disease increased by up to 10% of the population settled in this region, with Chile and Mexico being the territories with the highest rate of registered cases, followed by Brazil, Uruguay and Argentina that presents an intermediate and low incidence in the nations of Guatemala, Colombia and Peru (6) (7).

Regarding Ecuador, according to the technical report issued by the Ministry of Public Health (MSP) (8), a prevalence rate of 1074 cases per million inhabitants is recorded; In addition, as of May 2022 there were approximately 19,372 patients diagnosed with chronic kidney disease. The level of mortality of this affected population group is between 6% and 10%, a situation that results in high economic costs as a result of the therapies promoted for its due control, such is the case of dialysis that represents more than 168 million dollars (9).

Although chronic kidney disease has no cure, it is essential to pay attention to the first symptoms and complement with an early diagnosis duly validated by a professional, as this will allow implementing a relevant treatment according to the needs of the patient and the characteristics of their close socio-family environment, in order to control the clinical manifestations of the pathology, reduce the intensity of complications and delay the progression of the pathological condition (10).

Treatment to address chronic kidney disease depends on the state of severity in which a patient is. In the beginning, drugs can help control the first clinical manifestations of the pathology, in the later phases, other medical procedures are required such as hemodialysis, which helps control blood pressure and compensate for important minerals in the bloodstream; however, people diagnosed with CKD. In the last decade, about 45% of patients in grade IV and V, died before starting dialysis treatment, due to different cardiovascular complications, such as ventricular and supraventricular arrhythmias, which is why it is essential to make an early diagnosis and treatment. (11,12).

According to Bardají & Martínez (13), arrhythmias are extremely common during haemodialysis (HD) treatment, pose a risk factor for sudden death and are associated with a high prevalence of cardiovascular events, significantly increasing the mortality rate of chronic kidney patients. The appearance of these cardiac disorders derives from various risk factors that depend on the cardiovascular status of the patients and the changes or acute alterations that may occur during HD sessions.

In this regard, López & Vega (14) They report that the changes and excessive elimination of electrolytes that occur during the interdialytic period, increase the risk of developing cardiac arrhythmias (CAD). Currently, two-thirds of hemodialysis deaths are attributed to cardiovascular events and are generally related to ADL. Additionally, atrial fibrillation is the most frequent arrhythmia, with a level of incidence that affects approximately a population group that borders 25% of patients who are not on dialysis, but who suffer from kidney disease and up to 40% of patients on hemodialysis (13).

Intradialysis arterial hypotension is a very frequent condition that appears during the

hemodialysis procedure, being referred to as a risk factor that increases the probability for a patient to suffer from arrhythmias. Therefore, people who are receiving such treatment, have a high incidence of chronic complications and cardiac physiological alterations, which can lead even to the death of chronic patients (15).

On the other hand, in this group of patients, atrial fibrillation is considered the most frequent arrhythmia and represents a risk for the development of certain conditions such as ischemic stroke and hemorrhage; Although anticoagulation is effective against the prevention of these cerebrovascular events, its use can increase the probability of bleeding, which directly affects the mortality rate, being essential to differentiate the anticoagulants that suppose a greater benefit and efficacy (16).

Taking into account all the above, the present study emerged, which consists of a narrative literature review in order to determine the most relevant aspects around the management of arrhythmias in patients with chronic kidney disease on hemodialysis; For which a thorough analysis of different theoretical supports duly referred to that provide the academic probity that requires a work of this nature will be addressed, hoping to contribute with a concise and reliable background, which facilitates the development of future bibliographic inquiries in this same line of research.

This research is governed by the lines of research priorities of the Ministry of Public Health (MSP) 2013-2017 within area 15 of urinary, "Chronic kidney disease". In addition, updates to the KDIGO 2018 Consensus were considered, during and after hemodialysis sessions; and finally, the risk-benefit of the different groups of oral anticoagulants as stroke preventives in the course of arrhythmias was established.

Therefore, the main objective of the research focused on describing the current management based on scientific evidence of arrhythmias in patients with chronic kidney disease on hemodialysis, in addition to identifying the relevant aspects about arrhythmias and chronic kidney disease, comparing the different oral anticoagulants used in the prevention of strokes and determining the risk – benefit involved in the execution of the sessions of haemodialysis in patients with chronic kidney disease. Similarly, the question that guided the achievement of this

literature review is: What is the management of arrhythmias in patients with chronic kidney disease on hemodialysis?

## METHODOLOGY

The present bibliographic review of narrative type, contemplates a study approached under a qualitative approach, because it is based on non-numerical scientific evidence, a process that allowed to have a clear and concise perspective of the theme raised in the research. The development of the study contemplated the guidelines and aspects exposed in the PRISMA methodology (Preferred Reporting Items for Systematic Reviews and Meta Analyses).

The research design is descriptive, since we proceeded to describe in a clear and duly referred way, the most relevant aspects that revolve around the current management of arrhythmias in patients with chronic kidney disease on hemodialysis. Finally, the study was carried out under a cross-section, in order to specify the established objectives. The search strategy addressed in the development of this study considered the following parameters:

- Current management of DNA Arrhythmias in patients with chronic kidney disease OR Chronic renal failure
- Hemodialysis AND Arrhythmias
- Current Management of Arrhythmias OR Treatment of Arrhythmias
- Entermeted renal crónica AND Hemodiálisis AND Arritmias
- Arrhythmia or Cardiac Arrhythmia
- Anticoagulantes orales AND prevención AND accidentes cerebrovasculares NOT ECR
- Risk AND hemodialysis sessions
- Benefits AND hemodialysis sessions

All these operators were applied in the Databases: MedLine, PubMed, Lilacs, Redalyc, SciELO, Cochrane Plus and other sources of the Catholic University of Cuenca; Process addressed in April 2023. The selection and filtering process that was considered in this narrative literature review contemplated the following inclusion and exclusion criteria.

- Key words, management, treatment, arrhythmias, chronic kidney disease, hemodialysis.
- Year of publication; 2018-2023

- language; Studies published in Spanish or English.
- Results; publications with reliable and duly validated information.
- Types of studies; Those publications that are scientific articles, books, clinical trials and / or action protocols.

**Exclusion criteria**

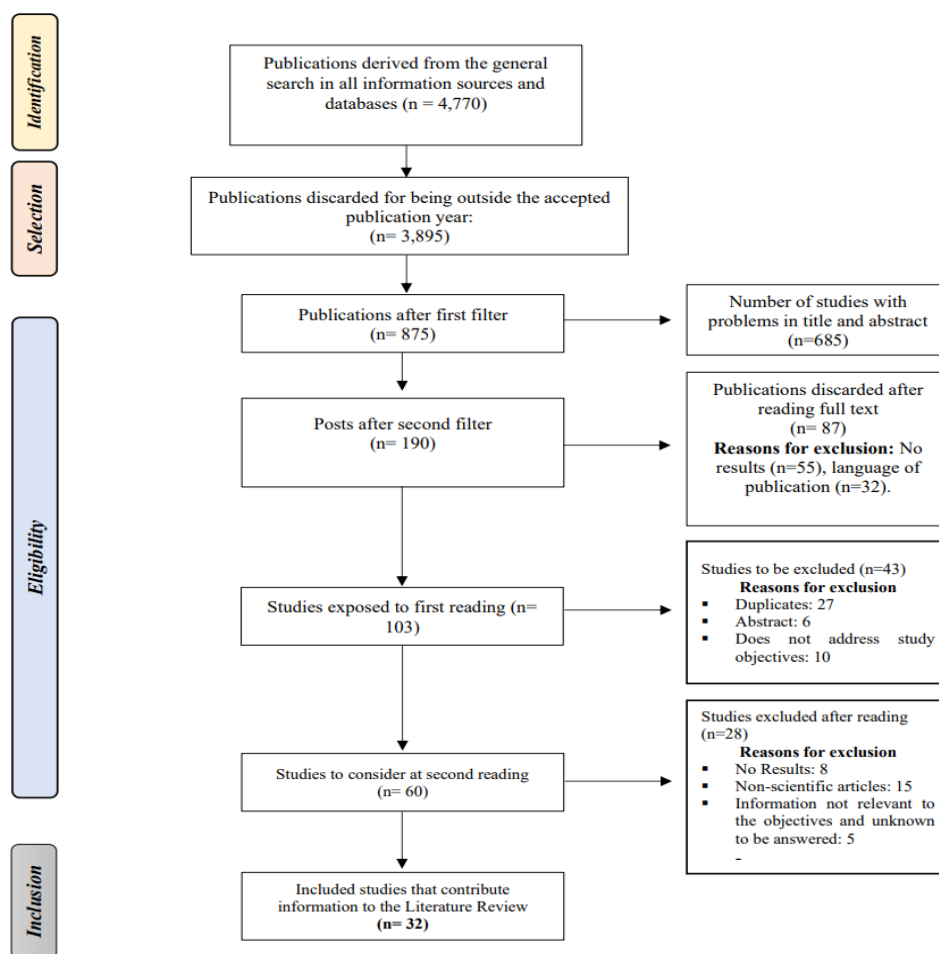
All studies that have been carried out empirically, without valid scientific support or duly proven. Studies that have been published before 2018 and are not deposited in scientific repositories. Publications that do not contain up-to-date literature and results are unreliable.

The procedure considered to develop and organize the information that supports this narrative bibliographic review, contemplates the

following steps: first, we proceeded to design the search strategy with the relevant parameters and logical operators; then, information sources and scientific databases were entered, where they were applied in a timely manner; Subsequently, the studies that were obtained were exposed to a thorough analysis considering the eligibility criteria; Finally, all the results were filtered taking into account the objectives and variables addressed in the theme.

These publications were exposed to a second reading, where those works published in a duplicate way, with deficiency or lack of relevant information in the abstract and with results irrelevant to the established objectives were discarded. As a final point, all the studies that resulted from this second analysis were exposed to a final reading, where those works were discarded according to exclusion criteria.

**Search diagram**



**GRAPH 1:** Selection of information according to PRISMA 2020 declaration  
**Source:** León, J. (2023)

The general search for studies in the different sources of information and databases exposed above, yielded 4,770 publications, of which we proceeded to discard those that were not published in the last 5 years, that is, a total of 3,895, obtaining a total of 875 investigations. 772 relevant studies were discarded, considering aspects such as deficiencies in the title and abstract, language of publication and lack of results, leaving 103 publications, where 43 investigations were discarded because they were duplicates and did not agree with the objectives. Of which 28 were discarded for not having reliable results, not being within the types of accepted publications and not containing valid information for the achievement of the systematic review, obtaining a total of 32 scientific articles, which would serve as support for the development of this bibliographic review.

## RESULTS

According to the World Health Organization (WHO) (4), chronic kidney disease is a pathological condition that contemplates the progressive and gradual loss of the function of the kidneys; That is, you can not eliminate toxins and / or control the volume of water in the body. This pathology is characterized by no clear clinical manifestations (13). According to Candelaria et al. (17), as the function of the kidneys begins to deteriorate, the individual's body will stop producing a series of hormones that participate directly, in arterial regulation, stimulation of red blood cells and / or difficulty absorbing calcium contained in food eaten daily, an element of utmost importance to maintain a healthy bone system (10).

The pathophysiology of chronic kidney disease contemplates a complex and multifactorial process; However, several studies agree that, initially, the pathology involves the reduction of nephrons in the renal reserve, elements referred to as the functional unit of the kidneys, responsible for the production of urine and blood filtration. This situation leads to kidney failure. Although the loss of functionality in the kidney tissue, it has the remaining capacity that allows it to adapt to this new physiological condition (18). On the other hand, according to Cen et al. (19) Early the body shows difficulty concentrating urine, followed by a significant decline in the ability to extract excess acid, phosphate and potassium.

When an individual's body presents a glomerular filtration rate (GFR) less than or equal to 15 mL/min/1.73 m<sup>2</sup>, renal failure is diagnosed as advanced, as a result, it loses the ability to dilute and/or concentrate urine adequately. Given this reality, the osmolarity of urine is commonly fixed between 300 to 320 mOsm / Kg and the urinary volume presents some complication when responding to the different variations that occur when ingesting water (18). Similarly, as the GFR decreases, the level of concentration of urea and creatinine begin to show a considerable increase, presenting uremia, a disorder by which the kidneys lose the ability to eliminate urea from the body of an individual, which results in the accumulation of waste from urine, in the blood (18).

### *Clinical manifestations*

According to the World Health Organization (WHO) (4), the clinical manifestations that entails the development of chronic kidney disease in a person are found; continuous nausea or vomiting, loss of body weight and physical weakness as a result of lack of appetite, difficulty falling asleep, loss of alertness, change in the frequency and amount of urine produced, permanent muscle cramps or spasms, pain and swelling of the feet and high blood pressure. However, several specialists agree that the main symptoms of the disease entail a series of cardiovascular, gastrointestinal, hematological, musculoskeletal, dermatological and hormonal alterations. (20).

### *Evaluation and diagnosis*

The evaluation of chronic kidney disease in a person, entails in the first instance, the development of a blood test called GFR that refers to the Glomerular Filtration Rate, which allows to validate the ability of the kidneys to filter blood; In addition, urine tests can be used. (21). On the other hand, according to the study addressed by Obando et al. (22), the diagnosis of this pathological condition is also based on the clinical manifestations or symptoms that an individual could evidence, so it is essential to perform blood and urine tests, because the decrease in the volume of urination below 500 milliliters, together with the increase of urea, creatinine and electrolytes in the blood, would leave in clear evidence the presence of chronic kidney disease.



Garcia et al. (23), states that among the therapeutic alternatives are associated with, controlling the diet, restricting the consumption of high amounts of proteins, salt and other products that are rich in potassium and phosphorus; administering certain drugs that inhibit angiotensin-converting enzyme and other electrolyte correctors such as phosphorus and potassium binders, especially in the very terminal stage of the disease; intake of correctors at the hormonal level, either Vitamin D that helps control the increase in parathyroid hormone or Erythropoietin, responsible for stimulating the generation of red blood cells; And finally, there are the procedures called hemodialysis and peritoneal dialysis. Hemodialysis can be performed intermittently, lasting 3 to 4 hours (24).

Patients diagnosed with chronic kidney disease who do not resort to a transplant or dialysis procedure are more likely to progress rapidly and cause death within months. In addition, continuous follow-up is essential, as physicians have the ability to help control clinical manifestations and prevent possible complications. (10). It is estimated that the mortality rate of these patients is 14%, while survival at 5 years is around 56% (13).

In another context, the arrhythmia is referred to by Cueva et al. (25), as "a pathological condition that contemplates the alteration of the heart rhythm of an individual, as a result of certain deficiencies in the internal electrical system of the heart" (p. 108); that is, a disorder that involves irregularity in the frequency and rhythm of your heartbeat, being able to beat too slowly or too fast (26).

According to González et al. (26), arrhythmias can occur in different ways in the body of a person, sometimes they are manifested as a flutter in the chest, which implies that the heart beats quickly configuring a harmless scenario for the survival of the affected; However, on other occasions these disorders have the ability to generate annoying and / or fatal symptoms (27).

A heart rhythm is qualified as normal, when its origin takes place in the sinus node and proceeds to go through the usual routes are any contrariety; While it is perceived as sinus, the one that begins in the node of the same name, which is located in the right auricular next to the superior vena cava, from where the cardiac stimulus proceeds to be

activated, and then propagates quickly to the related cell units through the intercalary discs that have a very low resistance to electrical impulses (28).

Under this premise, according to Amado et al. (29), arrhythmias contemplate an alteration of the heart rate that is outside the range considered normal, which ranges from 60 to 100 beats per minute. The reentry, implies that this impulse does not disappear after it has activated the heart, on the contrary, it proceeds to stimulate the depolarized fibers in a previous way, but that are outside their refractory phase (30). The heart has the ability to produce the impulses that give rise to their respective contractions; On the contrary, cardiac automatism contemplates a scenario where this organ continues to contract rhythmically, despite being isolated and perfused in saline solutions. Finally, triggered activity is a heart condition that generates new electrical impulses. (30).

The clinical manifestations that may occur in people suffering from this heart disorder, depends largely on the patient's body and the type of arrhythmia developed, however, the symptoms of greater notoriety and frequency are the following: irregular, accelerated (tachycardia) or slow (bradycardia) palpitations; dizziness, chest pain, feeling out of breath; fluttering in the chest, loss of alertness or consciousness (syncope) (31), as well as stress and anxiety; physical and/or mental fatigue; sweating; suffer from fainting regrets and continue (32).

According to Amado et al. (29) The individual is exposed to a test with an electrocardiogram, this procedure will allow to accurately determine the rhythm and heart rate; These results are obtained instantly, serving as a basis for the health professional to proceed to assess this condition and provide the necessary care. According to Patiño et al. (32), the electrocardiogram is a common and reliable test to diagnose the presence of an arrhythmia, because it records the electrical activity evidenced by a person's heart at any given time. (26).

Once the doctor has diagnosed the presence of arrhythmia in a person's body, it is essential to proceed with a treatment that allows contrasting this disorder and the appearance of its possible complications. (25). Therefore, the treatment of these cardiac disorders may consider the administration of certain medications or drugs

duly prescribed by the specialist physician; heart surgery; procedures such as vagal maneuvers or cardioversion (31).

According to Carcasés et al. (33), the life prognosis of a person diagnosed with arrhythmia, depends largely on the type of heart disorder developed by the individual and the presence of predecessor heart diseases such as heart failure, artery disease or valvular heart disease; However, the patient's life prognosis is good, as long as a healthy lifestyle that contributes to heart rate control is promoted.

Arrhythmias are common cardiovascular disorders in people suffering from chronic kidney disease and are on hemodialysis treatment; This population denotes its significant mortality rate, since it is estimated that between 45% and 50% of all patients assisted, die as a result of these cardiac alterations (31). The development of arrhythmias is a sequential and progressive process that begins before chronic kidney disease appears in an individual's body. More than 50%

of this population group have already developed these heart disorders, which constitute a risky scenario for their health status (11).

Among the most frequent and serious symptoms involved in the development of arrhythmias during hemodialysis, they denote the following: pain in the chest, mental alterations and heart palpitation, loss of sense and lack of hemodynamic stability. Many of these clinical manifestations are brief, calm and disappear once the session is over, others instead require continuous monitoring by means of an electrocardiogram.

In this regard, according to Platero et al. (34), at the moment that a patient is receiving a hemodialysis session and proceeds to experience a cardiac arrhythmia, the procedure must be interrupted and immediately, clear a central venous line, control the heart rate and, finally, anticipate the different resources or supplies that are required to apply the cardiopulmonary resuscitation protocol.

**Current management of arrhythmias during haemodialysis sessions**

Type of arrhythmia	Elective management	Alternative handling
Stable acute atrial fibrillation; It contemplates an irregular rhythm or rapid heart rate, which remains stable during the hemodialysis session and can lead to the formation of blood clots in the heart.	Continuous monitoring	Administration of the drug B-blocker or calcium antagonist; which has the ability to prevent calcium from entering the different cells that are part of the heart.
Unstable acute atrial fibrillation; Both the heart rate and rhythm are hesitant or change permanently during the hemodialysis session.	Synchronized electrical cardioversion	
Atrial fibrillation, chronic; An episode that increases the patient's risk of possible stroke, heart failure, and other heart complications.	B-blocker or calcium antagonist + anticoagulation Warfarin with the aim of preventing thrombi and emboli from forming	Amiodarone Aspirin
Isolated extrasystole; It consists of the abnormal activation of an additional beat, a fact that originates in the lower chambers of the heart, before a normal heartbeat takes place, this results in the lack of some heartbeats.	No treatment	
Frequent extrasystole; It contemplates all the beats that arise earlier than they should, that is, their appearance takes place prematurely, interrupting the heart rhythm briefly.	B-blocker	Calcium channel blocker
Supraventricular tachycardia; It leads to the appearance of a fast and wrong heart rhythm that affects the upper chambers of the heart.	Electrical cardioversion	Amiodarone

Stable ventricular tachycardia; A heart condition that results from abnormal electrical signals produced in the lower chambers of the heart.	Amiodarone	Administration of antiarrhythmic drugs such as Lidocaine / Procainamide
Unstable ventricular tachycardia; The heartbeat may be too fast, too slow, or irregularly shaped.	Electrical cardioversion	Amiodarone

**Fountain:** Lopez & Vega (35)

With regard to the administration of the drug called amiodarone, it is a drug with certain properties that help reduce the incidence of ventricular arrhythmias; while the use of B-blockers, are effective in the immediate postinfarction and in cases of congestive heart failure (35). The development of atrial fibrillation in a patient suggests the presence of an underlying pathological condition and is perceived as a risk factor that increases the likelihood of suffering an acute stroke and increases the mortality rate. (32).

In a hemodialysis session, as reported by Figuer et al. (36), it is common for the patient to develop atrial fibrillation, however, this condition does not require specific treatment, as the sinus rhythm usually reverses after a certain interval of time. Patients who experience paroxysmal atrial fibrillation during hemodialysis sessions should be approached similarly to chronic or persistent atrial fibrillation. (37).

Finally, Warfarin is a reliable alternative to counteract acute embolic cerebral vascular accidents, which is used through an anticoagulant procedure; However, in those individuals who have atrial fibrillation, the effectiveness of this drug is in continuous controversy, but considerably increases the likelihood of bleeding or hemorrhage (38).

The most prevalent arrhythmia in patients with chronic kidney disease who are on hemodialysis is atrial fibrillation (AF) (39). The continuous advances in science and medicine, allowed to discover a series of therapeutic interventions that help control and / or reduce the risk of a patient on hemodialysis suffering from strokes and reduce the mortality rate that occurs (40).

In this sense, anticoagulants are referred to as a series of drugs that contain certain compounds and / or principles that prevent the formation of blood clots and the different complications that derive from this condition. (41). Among the oral anticoagulants that are most frequently used to prevent strokes, warfarin, vitamin K antagonist (VKA), stands out. (42). According to the study undertaken by Ameriso & Pujol (43), the

administration of warfarin markedly reduces the risk that a patient presenting with atrial fibrillation arrhythmia will suffer from a stroke. It is estimated that approximately two thirds of patients treated with this anticoagulant managed to avoid the appearance of this complication. Despite the notable benefits of the use of the AVK anticoagulants previously exposed, its administration has been seriously conditioned, as a result of the different unpredictable properties it possesses and the significant risk or concern towards the risk of hemorrhage (44).

Among these anticoagulants denote precisely Apixaban, Dabigatran, Edoxaban and Rivaroxaban. The administration of these medications further reduces the likelihood of a patient suffering from stroke or any other systematic embolic event. (45). Currently, the introduction of oral anticoagulants NOAC means a remarkable advance in preventing stroke, serving as a fundamental basis for obtaining better clinical results in patients suffering from the type of arrhythmia called atrial fibrillation; However, the choice of any of these medications carries a certain risk of bleeding that must be analyzed individually. (42).

The intervention contributes to the control and monitoring of the individual's blood pressure, not to mention that it is a fundamental mechanism when balancing the minerals that are important for the blood, such as calcium, sodium and potassium (46). Although the development of hemodialysis is a reliable alternative for occupants with chronic kidney disease to feel better and achieve a longer survival time, it should be clear that this procedure is not the cure for this pathological condition, as it is a degenerative pathology that worsens permanently and progressively. (47)(48).

Among the risks involved in the execution of hemodialysis sessions for Zamora et al. (49), denote those detailed below: Problems related to vascular access, as it can become infected or the presence of a scar can lead to poor blood flow, and must need to go to a health unit to receive the proper professional assistance and not put at risk the patient's health status.



The unforeseen changes experienced by the patient's body in relation to water and chemical balance, can lead to muscle pain or cramps, stomach pains, physical - body weakness, continuous dizziness and the appearance of hypotension, a condition that leads to a sudden drop in blood pressure. (50). Similarly, according to Santana (51), these patients are exposed to suffer from high blood pressure; fluid overload that can lead to pulmonary edema, leading to fluid accumulation in the lungs; inflammation of the membrane surrounding the heart; Changing potassium levels can be high (hyperkalemia) or low (hypokalemia), among others.

With regard to the benefits of hemodialysis, according to the study addressed by Andrade et al., the following stand out: the patient manages to achieve an increase in physical and/or mental energy; evidence increased appetite; the accumulation of salt and fluids is reduced; there is less shortness of breath and possible swelling (52). In addition, they help patients achieve an ideal dry weight, which means not having an excessive amount of fluid in their body. This condition requires a healthy lifestyle, emphasizing a balanced diet and permanent physical activity, key aspects to control the individual's blood pressure (50 – 51).

Finally, an effective hemodialysis session promotes a better quality of life for the patient; contributes to the consolidation of greater physical and/or mental well-being; reduces the intensity and frequency of clinical manifestations or physical-bodily symptoms; a better sleep pattern is achieved; of recharging energy and contributing to its autonomy, when solving certain basic needs (52).

### CONCLUSIONS

Chronic kidney disease is a pathological condition that leads to the deterioration of kidney function, that is, the kidneys stop working normally, unable to get rid of toxins and excess fluids found in the bloodstream.

Currently, chronic kidney disease has a significant morbidity and mortality rate, which is why it is perceived as a serious public health problem that entails a high cost of living for patients and represents an extra burden for the patient's close socio-family environment and the health system of the territorial district where it operates. The way to deal with chronic kidney

disease depends on the severity of a patient; However, you can start with the administration of certain medications duly prescribed by a professional and continue with the procedure called hemodialysis, which allows you to filter toxins and water from the blood, just as the kidneys did when they were healthy.

Ventricular and supraventricular arrhythmias are common disorders that appear in hemodialysis, the increased likelihood for a patient to develop these heart conditions, is associated with the advanced age of the patient, dilation of the left atrium, hypertrophy of the left ventricle, cardiac calcifications, ischemic heart disease, inflammation, high blood pressure and the use of antiarrhythmics.

The current management of arrhythmias in patients with chronic kidney disease on hemodialysis depends on the type of cardiac disorder that the patient presents during the relevant sessions, however, today there is an elective treatment and an alternative one. In stable and unstable acute atrial fibrillation, continuous monitoring, application of synchronized electrical cardioversion, and administration of B-blocker or calcium channel blocker drug should be performed.

Anticoagulants are drugs that prevent the formation of blood clots and their use is aimed at preventing strokes. Among the oral anticoagulants that are most commonly used to prevent such events are vitamin K antagonists (VKAs), such as warfarin, and those that are not antagonistic or opposed to vitamin K (NOAC), such as apixaban, dabigatran, edoxaban, and rivaroxaban.

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### CONFLICT OF INTEREST

In the pursuit of the present study, there was no conflict of any kind.

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