South American Publishing

SAP Multidisciplinary Open. 2025; 3:60
doi: 10.62486/mo202560

REVIEW

Chronic renal failure: Clinical and therapeutic aspects for the approach

Insuficiencia renal crónica: Aspectos clínicos y terapéuticos para su abordaje

Jennifer Lizcano Ramírez[1], Angie Milena García Chica[1], Naara Saray Saltos Intriago[1], Jenrry Fredy Chávez-Arizala[1]

[1]Instituto Superior Tecnológico Adventista del Ecuador. Santo Domingo, Ecuador.

Cite as
Lizcano Ramírez J, García Chica AM, Saltos Intriago NS, Chávez Arizala JF. Chronic renal failure: Clinical and therapeutic aspects for the approach. SAP Multidisciplinary Open. 2025; 3:60. https://doi.org/10.62486/mo202560

Publication History
Submitted: 20-03-2024
Revised: 09-06-2024
Accepted: 22-09-2024
Published: 02-02-2025

ABSTRACT

Introduction: CKD was defined as the "presence of renal damage with a duration equal to or longer than three months, characterized by structural or functional abnormalities with or without a decrease in glomerular filtration rate to less than 60 ml/min/1,73m^2".
Objective: to describe the clinical features, diagnosis and treatment of CKD.
Methods: a literature review was performed using articles retrieved from PubMed, MEDLINE and SciELO databases, in the period between July and August 2024. Filters were used to select articles in Spanish and English. The terms ''Chronic Kidney Disease'', ''Nephrology'', ''Nursing'', ''Quality of Life'' were used, as well as their English translations, which were extracted from the Health Sciences Descriptors (DeCS). A total of 16 references were selected.
Development: chronic renal failure is evidenced by the gradual, increasing and definitive deterioration until the total or partial loss of glomerular filtration occurs, causing the filtration and purification of blood to be done through external factors such as peritoneal dialysis, hemodialysis, up to a renal transplant, then, several risk factors and different manifestations that serve to identify the possibility of suffering are listed.
Conclusions: knowledge about clinical, diagnostic and pharmacological aspects of Chronic Kidney Disease is a vital pillar for the management of this pathology by health personnel, the constant updating of the subject represents the main task of all personnel involved in its treatment.

Keywords: Chronic Kidney Disease; Nephrology; Nursing.

RESUMEN

Introducción: se definió a la Insuficiencia Renal Crónica como la "presencia de daño renal con una duración igual o mayor a tres meses, caracterizado por anormalidades estructurales o funcionales con o sin descenso de la tasa de filtración glomerular a menos de 60 ml/min/1,73m^2".
Objetivo: describir la clínica, diagnóstico y tratamiento de la Enfermedad Renal Crónica.
Métodos: se realizó una revisión bibliográfica mediante los artículos recuperados en las bases de datos PubMed, MEDLINE y SciELO, en el periodo comprendido entre julio y agosto de 2024. Se emplearon filtros para la selección de artículos en los idiomas español e inglés. Se emplearon los términos ''Enfermedad Renal Crónica'', ''Nefrología'', ''Enfermería'', ''Calidad de Vida''; asi como sus traducciones al inglés, los cuales fueron extraídos de los Descriptores en Ciencias de la Salud (DeCS). Se seleccionaron un total de 16 referencias.
Desarrollo: la insuficiencia renal crónica se evidencia por el deterioro gradual, creciente y definitivo hasta que se produce la pérdida total o parcial del filtrado glomerular haciendo que la filtración y purificación de la sangre se tenga que hacer mediante factores externos tales como diálisis peritoneal, hemodiálisis, hasta un trasplante renal, a continuación, se enlistan varios factores de riesgo y diferentes manifestaciones que sirven para identificar la posibilidad de padecer.
Conclusiones: el conocimiento acerca de los aspectos clínicos, diagnósticos y farmacológicos de la Enfermedad Renal Crónica constituye un pilar de vital importante para el manejo de dicha patología por el personal de salud, la constante actualización del tema representa en si la principal tarea de todo personal que se dedique a su trato.

Palabras clave: Enfermedad Renal Crónica; Nefrología; Enfermería.

© 2025; The Authors. This Open access article is distributed under the Creative Commons Attribution 4.0 license (https://creativecommons.org/licenses/by/4.0), which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.

INTRODUCTION

Patient assessment is the first stage performed by the nursing staff since it is based on collecting, organizing, and interpreting data and aspects of the affected person, which will help make the correct nursing diagnosis. Virginia Henderson's model is based on the theory of human needs for life and health as the central core for nursing action. It also considers that the fundamental role of nursing is to help the individual, healthy or sick, to preserve or recover his health, or to assist him in the last moments of his life, to fulfil those needs that he would fulfil by himself if he had the necessary strength, will or knowledge.[1]

Taking into account the quality of life of people with chronic renal failure, it could be deduced that several of the needs established in this theorizing are affected, such as the need to breathe properly, since with this disease, the gas exchange decreases, which causes fatigue in the patient, the need to drink and eat properly, because due to the fluid retention of this pathology, the diet of a patient suffering from chronic renal failure is dry, This is also affected by the need to eliminate normally by all means, this is a product of the fluid above retention caused by the deterioration of renal activity, as well as the need to move and maintain adequately, which is given by the pain in joints caused by a sedentary lifestyle, among others.[1]

CKD was defined as the "presence of renal damage with a duration equal to or greater than three months, characterized by structural or functional abnormalities with or without a decrease in the glomerular filtration rate to less than 60 ml/min/1,73m2".[2] It could also be defined as the presence of a structural or functional renal abnormality (sediment, imaging, histology) that persists longer than 3 months, with or without deterioration of renal function, or a glomerular filtration rate (GFR) < 60 ml/min/1,73 m2 without other signs of renal failure.

The KDIGO guidelines have introduced renal transplant patients, regardless of their degree of renal failure. The following are markers of renal damage: elevated proteinuria, alterations in the urinary sediment, electrolyte alterations or other alterations of tubular origin, and histological structural alterations.[1,2]

Adequate knowledge of this pathology and its clinical characteristics should be necessary for physicians and nurses. For this reason, the authors of this review aimed to describe the clinical features, diagnosis and treatment of Chronic Kidney Disease (CKD).

METHOD

A literature review used articles retrieved from the PubMed, MEDLINE and Scielo databases between July and August 2024. Filters were used to select articles in Spanish and English. External articles were added to the time frame due to their importance in the writing of this article, without the research being less than 90 % up to date.

The terms "Chronic Kidney Disease", "Nephrology" "Nursing", and "Quality of Life" were used, as well as their English translations, which were extracted from the Descriptors in Health Sciences (DeCS). A total of 16 references were selected, specifically adjusted to the topic in question, excluding those with possible biases in their methods.

DEVELOPMENT

The causes of CKD (Chronic et al.) can be grouped into vascular diseases, glomerular diseases, interstitial tubules and obstructive uropathies. Currently, in the country, the most frequent aetiology is diabetes mellitus, being responsible for 50 % of the cases of renal disease, followed by arterial hypertension and glomerulonephritis; its pathophysiology is due to the accumulation of products of protein metabolism and alterations that occur due to the loss of renal function. Toxic substances such as homocysteine, guanidines and β2 microglobulin have been identified, in addition to a series of metabolic and endocrine alterations. The CKD patient is also at an elevated risk for protein-calorie malnutrition, either induced by the underlying disease or by dialysis treatment.[3]

Risk factors

Chronic renal failure is evidenced by the gradual, increasing and definitive deterioration until the total or partial loss of glomerular filtration occurs, causing the filtration and purification of the blood to have to be done by external factors such as peritoneal dialysis, hemodialysis, or even renal transplantation. Among the risk factors, the presence of hypovolemia, vasoconstriction, use of diuretics, renin-angiotensin-aldosterone system inhibitors, family history of renal failure, age, chronic anaemia, low birth weight, glomerular filtration rate of surviving nephrons, etc., were.[3]

Clinical manifestations

Chronic renal insufficiency is one of the diseases that present signs and symptoms late; that is to say, at the beginning of this pathology, none of these is present; that is why this condition is also called silent since it is difficult to detect it so people who suffer from it do not know that this disease is developing in their system. However, the signs and symptoms that appear are the following: changes in urine, fatigue, itching, swelling of hands and feet due to fluid retention, shortness of breath and frequent pain in the lower back or lumbar area. When CKD is advanced, it can manifest itself with abnormally dark skin, bone pain, drowsiness, bad breath, vomiting, and excessive thirst, among others.[4]

CRI Classification

The classification of CKD is based on the decline in renal function assessed by the glomerular filtration rate (GFR). GFR is the best measure of renal function in healthy and diseased individuals. GFR varies according to age, sex and body size. The normal value in young adults is 120-130 mL/min/1,73 m2 SC, which decreases with age. On the other hand, a GFR of less than 60 mL/min/ 1,73m2 SC represents the loss of more than 50 % of normal renal function in adults; below this level, the prevalence of complications of CKD increases.[5]

Based on GFR, chronic renal failure is classified into five stages; an important aspect of this classification based on the severity of the disease is the application of an action plan in each of the different categories to prevent or delay the loss of renal function and the development of cardiovascular complications in these patients. Patients undergoing renal transplantation are classified as follows: all patients with renal transplantation are considered to have CKD, regardless of the level of GFR or the presence or absence of markers of renal damage. The damage to the native kidneys gives the rationale for this classification: the damage that the transplanted kidney invariably suffers because most of these patients already have complications of renal failure prior to renal transplantation. Another modification made by the KDIGO to the classification of CKD is related to the therapeutic modality. In this regard, the suffix "T" (renal transplant) should be added to all renal transplant patients, regardless of glomerular filtration rate (CKD 1-5). On the other hand, a "D" (dialysis) should be added to those patients with stage 5 CKD treated with a dialytic modality (peritoneal dialysis or hemodialysis). Regardless of the GFR at which dialysis treatment is initiated, all patients treated with any dialysis modality are classified as stage 5D CKD.[6]

Diagnostic Methods

The methods of diagnosis of chronic renal failure are diverse since, in many cases, there may be better procedures for the type of renal failure. However, these methods are of equal or greater importance. Among them, we have imaging studies. "These tests can identify structural abnormalities (shape and size) and obstructions in the renal system. The most frequent studies are ultrasonography, radiography and computed tomography, with or without contrast medium, since they can damage renal tissues. In selected cases, a renal biopsy is obtained for microscopy with immunofluorescence or electron microscopy".[6] In the urine examination, it is important to consider that" the concentration of albumin in the urine is an early indicator of renal damage. Proteinuria also appears in subjects with renal involvement due to hypertension, diabetes mellitus and cardiovascular ischemic events."[7]

According to the National Institute of Diabetes and Digestive and Kidney Diseases[8], some renal failure can be found through clinical studies which help to identify if there is any alteration within normal ranges; the two main tests when there is renal failure are: a blood test GFR (glomerular filtration rate) and a urine test to detect albumin in the urine, since this protein passes into the urine when the kidneys do not function properly, In the GFR test a value of 60 or more is within the normal range in older people, less than 60 may indicate kidney disease, but a GFR of 15 or less indicates kidney failure, people who are within this range need to undergo dialysis or a kidney transplant. In the urine test for albumin, the normal value ranges from 30 mg/g or less; more than 30 mg/g may indicate kidney failure.

Treatment

Pharmacological

The Mexican Institute of Social Security, Direction of Medical Benefits,[9]defines pharmacological treatment as varying according to the complications that will occur, usually given for hypertension, alleviation of swelling, anemia, cholesterol, and bone protection. Treatment with SGLT2 inhibitors may reduce the risk of progression of renal failure in patients with type 2 diabetes mellitus. It is recommended to treat adult patients with diabetes and hypertension with a combination of angiotensin-converting enzyme inhibitors and angiotensin receptor blockers or monotherapy with either of these two drugs to reduce the frequency of chronic renal failure. Treatment with statins at standard doses is recommended for CKD patients over 50 years of age or > 18 years of age with cardiovascular risk factors (diabetes, hypertension, etc.) to reduce the occurrence of cardiovascular events. Treatment with IV iron should be preferred in patients with CKD who require supplementation because it has fewer adverse events.

Renal replacement therapy

The general health advice[10] states that in the initiation of renal replacement therapy, it is suggested to consider and investigate one or more of the following factors: symptoms or signs attributable to renal failure (serositis, acid-base or electrolyte disorder, pruritus, etc.); inability to control volume status or blood pressure; progressive deterioration of nutritional status refractory to dietary intervention or cognitive impairment. Which often occurs when GFR is between 5 and 10 ml/min/1,73 m2. In adult patients ≥ 18 years who have a GFR < 15 ml /min per 1,73 m2, it is recommended to maintain a conservative behaviour prior to the initiation of dialysis, necessary close monitoring of the presence of uremic symptoms and complications, as well as the rate of GFR reduction.

Peritoneal Dialysis

Peritoneal dialysis is a procedure used in renal failure which consists in the introduction of a dialyzing solution into the peritoneum through a catheter, which is surgically placed by a specialist, through this device the dialyzing solution composed mostly of water with salt and other additives is placed and emptied into the peritoneum, done this procedure the catheter is disconnected from the solution bag and the liquid is left inside the cavity allowing the patient to move and do their daily activities normally, After several hours all the liquid that we introduce is drained eliminating toxins and excess fluid from the body, this fluid can be discarded into a container and be discarded through a toilet, it should be noted that as the hours pass the filtrate decreases, this is why this procedure should be performed 4 to 6 times a day, this whole procedure is called exchange, this procedure does not cure renal failure but serves to extend the life of the patient and get better health status.[10]

Hemodialysis

According to Cerezo[11], this treatment is depurative, through vascular access, such as a catheter or fistula, with direction towards an extracorporeal circuit and artificial membrane where the dialysis takes place and returns to the blood, once depurated, through

the access, to the organism. It replaces the kidney's main functions using soft tubes in a dialysis machine and is characterized by a complex therapeutic regimen that influences the patient's well-being. Hemodialysis is a procedure whose purpose is to replace renal function; its objective is to filter the wastes found in the blood that are harmful to health. Therefore, it requires vascular access, a dialyzer or a hemodialysis filter. It is also used persistently in advanced CKD until the kidney can be transplanted. Finally, it is also used in emergency cases so that situations due to CKD decompensation can be resolved quickly.

Renal transplant

According to Martín and Errasti[12], renal transplantation is one of the procedures used in people with chronic terminal renal failure, which consists of replacing the damaged organ with a healthy one so that it fulfils the normal function of the organism to enter the waiting list to receive the organ different factors are taken into account, the condition of the patients is evaluated. Their severity is identified, and this procedure is classified according to the donor type; in the case of a living donor, he/she voluntarily gives a healthy kidney; before the donation, tests are performed to identify the viability and compatibility of the organ with the recipient. In the case of a deceased donor, it is understood as a person with brain death or death due to cardiac arrest, followed by a repetition of the process; as previously mentioned, if the organ is viable and compatible with the recipient, it is extracted.

Lifestyle Medicine

According to Morán[13], diet modification includes low protein intake, calories of approximately 35-40 Kcal/kg/day and low salt intake. Control of arterial hypertension: Follow-up of blood pressure and medical control to see if the patient is under pharmacological treatment. Control of hyperglycemia: Intensive control is recommended in order to avoid microalbuminuria and, consequently, associated neuropathy.

Nursing care in CKD

Machado,[14] defines that chronic renal failure is a disease that requires monitoring and control on a daily basis so that the patient can survive in the best way possible.

Quality of life

The quality of life of patients with renal failure on hemodialysis is low; other studies have related the study variables discussed below. Gallardo OA and Franco CB studied the relationship between adherence to treatment and quality of life in patients with renal failure on hemodialysis, establishing a moderate relationship between the study variables, concluding that both quality of life and adherence to treatment are very good.[15]

CRI and Emotional Problems

Emotional problems:

Castro[16] describes that generally, patients with CKD are affected emotionally because they are not able to manage their emotions efficiently, and this can have a great impact on them since they have to assimilate and accept this new situation or even the dependence on hemodialysis. Among these emotional changes are reflected anxiety, depression, low self-esteem, anger, and guilt for not having taken better care of themselves, and it can be assured that in the process, there would be an alteration that directly affects the patient and does not allow the proper development of their treatment. People with this disease are usually in a mental and emotional imbalance when they learn of their unfavourable situation.

CONCLUSIONS

The health personnel's knowledge about the clinical, diagnostic and pharmacological aspects of CKD constitutes a vital pillar for managing this pathology; the constant updating of the subject represents the main task of all personnel dedicated to its treatment.

FINANCING

The authors of this research did not provide funding for this study.

CONFLICT OF INTEREST

The authors declare that there was no conflict of interest.

AUTHOR'S CONTRIBUTION

Conceptualization: Jennifer Lizcano Ramírez, Angie Milena García Chica.
Data Curation: Jennifer Lizcano Ramírez, Angie Milena García Chica.
Formal analysis: Jennifer Lizcano Ramírez, Naara Saray Saltos Intriago.
Research: Jennifer Lizcano Ramirez, Angie Milena Garcia Chica.
Methodology: Jennifer Lizcano Ramírez, Naara Saray Saltos Intriago.
Project management: Jennifer Lizcano Ramírez, Angie Milena García Chica.
Resources: Jennifer Lizcano Ramírez, Naara Saray Saltos Intriago.
Software: Jennifer Lizcano Ramírez, Angie Milena García Chica, Jenrry Fredy Chávez-Arizala.
Supervision: Jennifer Lizcano Ramírez, Angie Milena García Chica.

Validation: Jennifer Lizcano Ramírez, Naara Saray Saltos Intriago.
Display: Jennifer Lizcano Ramírez, Angie Milena García Chica, Jenrry Fredy Chávez-Arizala.
Copywriting - original copywriting: Jennifer Lizcano Ramírez, Naara Saray Saltos Intriago.
Copywriting - proofreading and editing: Jennifer Lizcano Ramírez, Jenrry Fredy Chávez-Arizala.

REFERENCES

1. Pinillos-Patiño Yisel, Herazo-Beltrán Yaneth, Gil Cataño Jorge, Ramos de Ávila Johanna. Actividad física y calidad de vida en personas con enfermedad renal crónica. Rev. méd. Chile. 2019;147(2): 153-160.

2. Venado, A., Moreno, J., Rodríguez, M., & López, M. INSUFICIENCIA RENAL CRÓNICA. UNIDAD DE PROYECTOS ESPECIALES UNIVERSIDAD NACIONAL AUTÓNOMA DE MÉXICO. 2009. http://www.facmed.unam.mx/sms/temas/2009/02_feb_2k9.pdf

3. Rodríguez-Ramos J, Herrera-Miranda G. Factores de riesgo relacionados con enfermedad renal crónica. Policlínico Luis A. Turcios Lima, Pinar del Río, 2019. Medisur [revista en Internet]. 2022 [citado 2022 Ene 12]; 20(1):[aprox. -59 p.].

4. Martínez Ginarte. Guillermo, Guerra Domínguez. Electra, Pérez Marín. Daiana. Enfermedad renal crónica, algunas consideraciones actuales. Multimed [Internet]. 2020 Abr [citado 2024 Sep 07] ; 24(2): 464-469.

5. D. Rodríguez Puyol, H. Bouarich, B. Hernández, Sevillano, P. Rodríguez Doyagüez, G. de Arriba de la Fuente. Enfermedades renales: concepto, etiopatogenia y clasificación. Medicine - Programa de Formación Médica Continuada Acreditado. 2023;13(80):4715-4719

6. Dehesa, E. (12 de diciembre de 2008). medigraphic. Recuperado el 4 de agosto de 2023, de https://www.medigraphic.com/pdfs/residente/rr-2008/rr083b.pdf

7. López-Heydeck, S., López-Arriaga, J., Montenegro-Morales, L., Cerecero-Aguirre, P., & Vázquez-de Anda, G. Enfermedad renal crónica; definición y clasificación. Artemisa en línea. 2008;3(3): 73-78

8. National Institute of Diabetes and Digestive and Kidney Diseases. (abril de 2017). niddk.nih.gov. Recuperado el 4 de agosto de 2023, de https://www.niddk.nih.gov/health-information/informacion-de-la-salud/enfermedades-rinones/informacion-general/diagnostico

9. INSTITUTO MEXICANO DEL SEGURO SOCIAL DIRECCIÓN DE PRESENTACIONES MÉDICAS. (3 de mayo de 2019). imss.gob.mx. Recuperado el 4 de agosto de 2023, de https://www.imss.gob.mx/sites/all/statics/guiasclinicas/335GRR.pdf

10. CONSEJO DE SALUBRIDAD GENERAL. (9 de diciembre de 2015). imss.gob.mx. Recuperado el 4 de agosto de 2023, de https://www.imss.gob.mx/sites/all/statics/guiasclinicas/727GRR.pdf

11. Cerezo, K. NIVEL DE RESILIENCIA E INSUFICIENCIA RENAL CRÓNICA EN PACIENTE EN HEMODIÁLISIS. 1-37. http://dspace.utb.edu.ec/bitstream/handle/49000/6518/E-UTB-FCJSE-PSCLIN-000170.pdf?sequence=1&isAllowed=y%20P%C3%A1g%2013

12. Martín P., Errasti P. Trasplante renal. Anales Sis San Navarra. 2006;29(Suppl 2):79-91.

13. Morán, K. (INSUFICIENCIA RESPIRATORIA AGUDA EN PACIENTE MASCULINO DE 59 AÑOS CON ANTECEDENTES DE INSUFICIENCIA RENAL CRÓNICA. 1-49. http://dspace.utb.edu.ec/bitstream/handle/49000/8758/E-UTB-FCS-TERRE-000086.pdf?sequence=1&isAllowed=y

14. Machado, P. Cuidados de Enfermería en pacientes que reciben Hemodiálisis. Ecuador, 2018. 1-51. http://dspace.unach.edu.ec/bitstream/51000/5683/1/UNACH-EC-FCS-ENF-2019-0025.pdf

15. Mariscal-Quispe E, Alfaro-Angulo MA. Adherencia al tratamiento y calidad de vida en pacientes con insuficiencia renal crónica en hemodiálisis. Trujillo, Perú. 2019. UCV Sci. Biomed. 2021; 4(1): 23-30.

16. Castro, M. CRISIS DE ANSIEDAD Y SU INFLUENCIA EN EL ESTADO EMOCIONAL DE PACIENTE FEMENINO-MASCULINO. 1-46