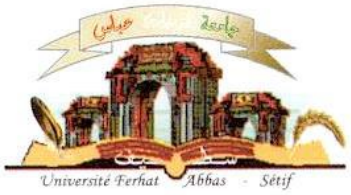
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كلية علوم الطبيعة و الحياة

Department of Biology and Animal Physiology

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Presented by
Alioua Asma
Aribi Dina Noursime

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Pr Boulgueraguer Z	univ . Sétif 1	President
Dr Laadel N	univ . Sétif 1	supervi
Dr Guetaaf S	univ . Sétif 1	Examiner

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Abstract

Chronic Kidney Disease (CKD) is an impairment of the kidney defined by a permanent decrease in the rate of glomerular filtration. Its chronic nature is confirmed by biological signs present for more than three months. It results from the progressive destruction of the renal parenchyma and progresses more or less rapidly toward complete renal failure. Long silent, kidney disease first manifests biologically and then clinically. CKD is a major public health problem in both developed and developing countries. Its management generates significant costs that are reflected first and foremost in the direct costs associated with the different treatments of the pathology. It is also reflected in indirect costs associated with the losses caused by the disease in terms of economic activity. The diagnosis of CKD is retained when the GFR is less than 60 mL/min/1.73 m². This definition guides management at each stage of the disease. Early detection of CKD is based on creatinine assay, estimation of GFR, and assay of microalbuminuria in patients with risk factors for developing this dysfunction. In the presence of renal insufficiency, it is necessary to look for complications but also for factors of progression. Whatever the stage, and in the presence of isolated microalbuminuria, these patients have an increased cardiovascular risk compared with the general population. Early-onset high blood pressure and microalbuminuria are the two major modifiable factors of progression. RAAS blockers reduce albuminuria flow, arterial hypertension, and decline of renal function. Metabolic and bone disorders, but also anemia, appear in stage 3b and require specialized management as well as well-conducted prevention by dietary rules.

Keywords: chronic kidney failure, biochemical parameters

الملخص

يُعدّ مرض الكلى المزمن (Chronic Kidney Disease – CKD) اختلالًا في وظيفة الكلى يتمثل في انخفاض دائم في معدل الترشيح الكبيبي .(Glomerular Filtration Rate – GFR) ويُؤكَّد الطابع المزمن لهذا المرض من خلال وجود علامات بيولوجية تستمر لأكثر من ثلاثة أشهر. وينتج هذا المرض عن التدمير التدريجي للنسيج الكلوي (البرنشيم الكلوي)، ويتطور بوتيرة متفاوتة نحو الفشل الكلوي الكامل .غالبًا ما يبقى مرض الكلى صامتًا لفترة طويلة، إذ تظهر مظاهره في البداية على المستوى البيولوجي، ثم لاحقًا على المستوى السريري. ويُعدّ مرض الكلى المزمن مشكلة صحية عامة كبرى في كلٍّ من البلدان المتقدمة والنامية. كما أن تدبيره العلاجي يترتب عليه تكاليف اقتصادية كبيرة، تنعكس أساسًا في التكاليف المباشرة المرتبطة بالعلاجات المختلفة للمرض، إضافةً إلى التكاليف غير المباشرة الناتجة عن الخسائر المرتبطة بانخفاض النشاط الاقتصادي بسبب المرض .يُثبت تشخيص مرض الكلى المزمن عندما يكون معدل الترشيح الكبيبي أقل من **60مل/دقيقة/1.73 م²** .ويُعد هذا التعريف أساسًا لتوجيه التدبير العلاجي في مختلف مراحل المرض. ويعتمد الكشف المبكر عن المرض على قياس **الكرياتينين** في الدم، وتقدير معدل الترشيح الكبيبي، وقياس **الميكروألبومين في البول (Microalbuminuria)** لدى المرضى الذين لديهم عوامل خطر لتطور هذا الاضطراب .وعند وجود قصور كلوي، ينبغي البحث عن المضاعفات المحتملة وكذلك عن عوامل تسارع تطور المرض. وفي جميع المراحل، وحتى في حالة وجود ميكروألبومينوريا معزولة، فإن هؤلاء المرضى يواجهون خطرًا متزايدًا للإصابة بأمراض القلب والأوعية الدموية مقارنةً بعامة السكان. ويُعد كلٌّ من **ارتفاع ضغط الدم المبكر** و**الميكروألبومينوريا** من أهم العوامل القابلة للتعديل التي تؤثر في تطور المرض. كما أن **مثبطات نظام الرينين–أنجيوتنسين–ألدوستيرون (RAAS)** تسهم في تقليل طرح الألبومين في البول، وخفض ضغط الدم الشرياني، وإبطاء تدهور وظيفة الكلى . وتظهر الاضطرابات الأيضية والعظمية، بالإضافة إلى **فقر الدم،** عادةً في المرحلة **3b**من المرض، وتتطلب تدبيرًا علاجيًا متخصصًا، إلى جانب إجراءات وقائية فعّالة تعتمد أساسًا على الالتزام بقواعد غذائية مناسبة.

الكلمات المفتاحية :الفشل الكلوي المزمن، المؤشرات البيوكيميائية.

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Introduction

Since the dawn of time, the human being has been a complex entity, always living in interaction with peers. Human beings are destined to face both the good and bad events of daily life; the latter are sources of various psychological and physical disturbances, which may sometimes be temporary, reactive, or irreversible, such as chronic diseases. A chronic disease is an incurable, permanent, and even irreversible condition that requires lifelong care. Among these chronic pathologies, our choice of research topic focused on **Chronic Kidney Failure (CKF)** (Thiam, 2012).

Chronic kidney failure is a complex disease because of the multiplicity of its causes and the systemic damage it generates. The aging of the population and the progression of vascular and diabetic nephropathies are causing a regular increase in the prevalence of chronic kidney failure [Amekoudi, 2012]. Its progression is still most often inexorable toward the so-called terminal stage requiring extrarenal purification. CKF is characterized by a diseased kidney, incapable of carrying out the tasks of filtration and elimination of waste from the blood that normally fall to it. It most often results from complications related to hypertension or diabetes [Hoffmann et al., 2004]. In Algeria, the majority of patients who have lost both kidneys are treated only by in-center hemodialysis (90% of patients). At the end of 2013, there were 18,000 chronic hemodialysis patients. Other methods of treatment are clearly in the minority, with only 1,000 renal transplant recipients under follow-up and 400 patients treated by home peritoneal dialysis (PD). In-center hemodialysis cost the community 300 million euros in 2013. These are the direct costs; the indirect costs are more difficult to estimate (www.lesoirdalgerie.com) (kalantar-Zadeh,K.,et al. 2020).

Patients suffering from CKF are subjected to renal replacement therapy by dialysis or kidney transplantation. Hemodialysis is a technique used for more than 40 years to replace the principal functions of healthy kidneys: filtering the blood (eliminating its wastes) and balancing fluid levels by removing waste from the blood and excess water. The machine therefore consists of a filter through which the patient's blood circulates, as well as a fluid called dialysate with which the patient's blood is in contact. Exchanges occur between blood and dialysate so that the blood eliminates certain substances (urea, creatinine, potassium, etc.) that have not been filtered by the deficient kidneys. The blood then returns to the patient through a tubing system. Hemodialysis also serves to remove excess accumulated fluid. Most patients requiring hemodialysis treatments

urinate very little, so that all the fluids they absorb accumulate. Often, a patient will thus gain 1 to 2 kg per day. During dialysis treatment, this excess fluid can be removed by creating pressure in the filter (Jungers et al., 2011).

The patient, especially the one who is seriously ill, is the loneliest being in the world. A victim of a disease still unknown, the object of care mysteriously entrusted to foreign hands, isolated in the face of the medical team pulling the strings of his destiny, kept at a distance by his family, set apart from society, he is alone as he has never been in his life, with deep inside him the haunting thought of possible, imminent death. Chronic kidney failure severely slows down patients' lives; life, plans, and opportunities for social participation are interrupted, etc. This disease disrupts the world of the hemodialysis patient in many different ways [Hoffmann et al., 2004; Jungers et al., 2011]. Some patients, once placed on dialysis, continue to experience psychological malaise, emotional shock, upheaval, a real psychic trauma, and anxiety about their future, their family balance, their symptoms, and the progression of their disease. These elements are a source of anxiety and even depression for the patient and those around him. Indeed, the patient undergoes a loss of health status, and projecting into the future announces only a perspective of death. The duration of the hemodialysis session places some patients in a state of despair, sadness, and fatigue regarding their condition, the state of their bodies, and a disease that has completely changed their lives. This is what affects the patient's mood and may even induce depression (Haddoum, 2013).

In this research work, we set ourselves the following objectives:

- To carry out a well-documented and updated literature study on all aspects of chronic kidney failure: pathophysiology, epidemiology, etiology, diagnosis, and therapeutics used.
- To conduct a statistical study over one year (Mars 2025 - Mars 2026) of cases of chronic kidney failure recruited at the Urology, Nephrology, and Renal Transplantation services, Saâdna Abdennour University Hospital Center (CHU Sétif).
- To learn and apply the biochemical analysis techniques used for the diagnosis and therapeutic monitoring of patients with chronic kidney failure treated at the Urology, Nephrology, and Renal Transplantation services, Saâdna Abdennour University Hospital Center (CHU Sétif)

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