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Review

Management of Systemic Arterial Hypertension in Chronic Kidney Disease Patients

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ABSTRACT

Arterial hypertension is a significant risk factor for the progression of chronic kidney disease (CKD) and is closely associated with cardiovascular events. This article reviews strategies for managing hypertension in CKD patients, emphasizing adequate blood pressure control, the use of antihypertensive medications and specific considerations for this population. A multidisciplinary, individualized approach, based on updated guidelines, is extremely important to minimize complications and improve clinical outcomes. Recent evidence suggests that a personalized approach is essential to balance blood pressure control and the preservation of renal function.

Keywords: Arterial hypertension; Chronic kidney disease; Clinical management; Antihypertensives; Cardiovascular complications

Introduction

Arterial hypertension is a prevalent condition and one of the main risk factors for cardiovascular and kidney diseases worldwide. It is estimated that more than 30% of the global adult population has hypertension and this prevalence increases substantially in individuals with chronic kidney disease (CKD)[1]. CKD, in turn, affects about 10% of the global population and is characterized by a progressive loss of renal function, often leading to the need for renal replacement therapy. The relationship between hypertension and CKD is bidirectional. Uncontrolled hypertension can accelerate the loss of renal function, while CKD contributes to resistance to antihypertensive treatment due to mechanisms such as activation of the renin-angiotensin-aldosterone system (RAAS), sodium and water retention and endothelial dysfunction[2-4]. Therefore, proper management of hypertension in CKD patients is crucial to slow disease progression, reduce cardiovascular risk and improve quality of life. Despite significant advances in hypertension management, several challenges persist in CKD patients[5,6]. These include the appropriate selection of medications, personalized blood pressure targets and the management of comorbidities. Recent guidelines highlight the importance of a patient-centered approach, using evidence-based strategies that consider the severity of CKD, associated clinical conditions and the risk of adverse events[7].

Objectives

This article aims to review the current literature on hypertension management in CKD patients, addressing aspects such as blood pressure control targets, pharmacological and non-pharmacological therapies, as well as specific challenges faced by this population.

Materials and Methods

A bibliographic review of articles published in PubMed, ScienceDirect and SciELO databases was carried out to support this study.

Discussion

The approach to managing hypertension in CKD patients involves a combination of pharmacological and non-pharmacological interventions, as well as strict monitoring. Defining blood pressure targets is key to preventing both the progression of CKD and cardiovascular complications. Clinical guidelines generally suggest a target blood pressure lower than 130/80 mmHg, especially in patients with significant proteinuria[8].

Drugs that inhibit the renin-angiotensin-aldosterone system (RAAS), such as angiotensin-converting enzyme inhibitors (ACEIs) and angiotensin II receptor blockers (ARBs), are recommended as first-line therapy. These medications not only lower blood pressure but also provide renal protection by reducing proteinuria and slowing the progression of renal damage[9]. However, caution is required in patients with hyperkalemia or severely compromised renal function. Diuretics also play a critical role, particularly in the advanced stages of CKD, where sodium and fluid retention are common. While thiazide diuretics are effective in earlier stages, loop diuretics are preferred in more severe stages due to their greater potency. In refractory cases, using mineralocorticoid receptor antagonists, such as spironolactone, may be considered, although with caution to avoid hyperkalemia[10,11].

An important point to consider when using medications that act on the RAAS and potassium-sparing diuretics is the propensity for developing hyperkalemia. Patho physiologically, ACEIs, ARBs and potassium-sparing diuretics (e.g., spironolactone and eplerenone) reduce the production or action of aldosterone. Consequently, potassium excretion by the distal tubules and collecting ducts of the nephron is diminished, leading to a buildup of extracellular potassium. In CKD patients, the kidney's potassium excretion capacity is already compromised by the reduction in glomerular filtration rate; therefore, the risk of hyperkalemia becomes even more significant[12]. This condition can result in cardiac arrhythmias and, if not properly monitored, may be fatal. For these reasons, frequent laboratory monitoring of serum potassium levels is recommended for patients on these classes of drugs, especially in advanced CKD stages and in individuals with other associated comorbidities. Another relevant aspect in the management of dialysis-stage patients is the indication of beta-blockers as a first-line antihypertensive treatment. Recent studies suggest these drugs offer benefits in reducing cardiovascular events, which are the main cause of morbidity and mortality in this population. In hemodialysis patients, beta-blockers help control heart rate, limit cardiac workload and may mitigate adverse effects related to sympathetic overactivity[13], common in advanced CKD. Furthermore, they appear to reduce the incidence of fatal arrhythmias, which is particularly relevant in individuals with frequent electrolyte imbalances. Thus, the use of beta-blockers in dialysis patients is increasingly emphasized to improve cardiovascular risk profiles and survival.

Non-pharmacological interventions, including reducing salt intake, adopting healthy diets, weight control and regular physical exercise, complement clinical management[14,15]. These strategies not only improve blood pressure control but also metabolic and cardiovascular outcomes. Despite advances, gaps remain in the management of hypertension in CKD. Treatment adherence continues to be a challenge, particularly due to the complexities of therapeutic regimens and medication side effects. In addition, the diversity of individual responses to treatment highlights the need for a personalized approach, considering factors such as age, comorbidities and treatment tolerance.

Conclusion

Managing hypertension in CKD patients requires a comprehensive approach that combines pharmacological and non-pharmacological interventions. Defining appropriate blood pressure goals and selecting medications carefully are essential to prevent the progression of renal disease and reduce cardiovascular risk. RAAS inhibitors, diuretics and mineralocorticoid receptor antagonists play central roles, while lifestyle modifications complement pharmacological therapy. Recent evidence reinforces the importance of an individualized approach, taking into account patients' clinical characteristics and preferences. However, barriers such as poor treatment adherence and limited access to healthcare continue to negatively affect outcomes. Future research should explore new therapies and approaches to improve effectiveness and adherence, as well as identify biomarkers that help in risk stratification and personalized care. Promoting health education and providing multiprofessional support are critical to optimizing the management of hypertension in CKD patients, contributing to better clinical results and quality of life. Thus, integrated, patient-centered care must be the cornerstone of treatment for this vulnerable population.

References

1. Agarwal R, Flynn J. Blood Pressure Control in Chronic Kidney Disease. Clin J Am Soc Nephrol 2019.
2. Bakris GL, et al. Optimizing Hypertension Management in CKD. Kidney Int 2020.
3. Bilo G, et al. Home Blood Pressure Monitoring in CKD Patients. Nephrol Dial Transplant 2020.
4. Heerspink HJL, et al. Emerging Therapies for CKD. Nat Rev Nephrol 2021.
5. Kidney Disease: Improving Global Outcomes (KDIGO) Blood Pressure Work Group. KDIGO Clinical Practice Guideline for the Management of Blood Pressure in Chronic Kidney Disease. Kidney Int 2021.
6. KDOQI Clinical Practice Guidelines for Hypertension and CKD. Am J Kidney Dis 2019.
7. Levin A, et al. Global Burden of CKD. Lancet 2020.
8. Patel RK, et al. Advances in Non-pharmacological Interventions for CKD. J Am Soc Nephrol 2018.
9. Pugh D, Gallacher PJ, Dhaun N. Challenges in Hypertension Management in CKD. Clin Hypertens 2017.

10. Rifkin De, et al. Sodium Intake and CKD Outcomes. Am J Kidney Dis 2019.
11. Taler SJ, et al. Resistant Hypertension in CKD. Hypertension 2021.
12. Townsend RR, et al. Renin-Angiotensin System Blockade in CKD. J Clin Hypertens 2021.
13. Webster AC, et al. Screening and Early Diagnosis of CKD. JAMA 2020.
14. Whelton PK, et al. ACC/AHA Hypertension Guidelines 2017.
15. Wright JT, et al. Intensive Blood Pressure Control and CKD Progression. N Engl J Med 2015.