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Tailored Treatments:

managing blood pressure in people with diabetes and kidney disease

Controlling blood pressure is essential for people with diabetes, especially when it coexists with chronic kidney disease (CKD). Both conditions are closely linked and potentiate each other, increasing the risk of serious complications such as progressive kidney deterioration or cardiovascular disease (1). It is estimated that more than 70% of people with type 2 diabetes mellitus (T2DM) have hypertension (2). This combination requires a personalized and rigorous therapeutic approach, with close follow-up by the medical team.

Hypertension, when associated with diabetes, accelerates vascular damage and contributes to the progressive decline of kidney function. Moreover, simultaneous control of blood glucose and blood pressure has been shown to improve survival and reduce the need for renal replacement therapy such as dialysis. For all these reasons, intensive and structured management of blood pressure is considered a priority in this group of patients.

1. BLOOD PRESSURE TARGETS

According to current clinical guidelines, blood pressure targets must be adapted to each patient's characteristics. In general, maintaining blood pressure < 130/90 mmHg is recommended, as no evidence supports lower targets in people with T2DM (2, 3). Strict control helps slow CKD progression and reduces cardiovascular risk.

The approach must be gradual yet firm, avoiding abrupt reductions that could compromise renal perfusion. In older patients or those with significant comorbidities, targets may need to be individualized to balance efficacy and tolerance.

2. STEPWISE TREATMENT: FROM GENERAL TO PERSONALIZED

Management of hypertension in patients with diabetes and CKD should be progressive and adapted. First-line therapy involves angiotensin-converting enzyme inhibitors (ACE inhibitors), such as enalapril or ramipril, or angiotensin II receptor blockers (ARBs), such as losartan or valsartan, due to their ability to lower blood pressure, protect the kidney, and reduce proteinuria (4).

Of note, the antihypertensive effects of drug classes aimed at preventing or treating cardiovascular and renal complications in diabetes. SGLT2 inhibitors (such as dapagliflozin or empagliflozin) have become a highly beneficial option: they have a moderate BP-lowering effect but are highly effective at reducing albuminuria and preventing renal decline and cardiovascular events (5). Therefore, although not strictly antihypertensive drugs, they should be part of the treatment of all patients with T2DM. Third, a non-steroidal mineralocorticoid receptor antagonist (MRA) (eg, finerenone) may be added. Like SGLT2 inhibitors, finerenone has a modest effect on BP but has demonstrated an 18% reduction in renal events and a 14% reduction in cardiovascular events. It is indicated for T2DM patients with CKD and albuminuria despite maximal tolerated ACE/ARB therapy (6).

Finally, GLP-1 receptor agonists (GLP-1RA) such as semaglutide have become treatments of choice in patients with T2DM and overweight/obesity, prior cardiovascular events, and/or kidney disease. These drugs also lower blood pressure (5–10 mmHg on average), making them an attractive strategy to optimize BP control in eligible patients (7).

This combined approach achieves better BP control, greater kidney protection, and a significant reduction in cardiovascular risk.

3. WHAT HAPPENS WHEN BLOOD PRESSURE REMAINS HIGH? RESISTANT HYPERTENSION

Hypertension is considered resistant when BP targets are not achieved despite using three antihypertensive drugs (including a diuretic)[8]. This situation is more frequent in individuals with diabetes and kidney disease.

Common contributing mechanisms include sodium retention, sympathetic nervous system overactivity, and endothelial dysfunction. In such cases, long-acting thiazide-like diuretics (such as chlorthalidone or indapamide) or beta-blockers (such as bisoprolol or carvedilol) may be used. Newer, safer agents acting selectively on aldosterone with lower hyperkalemia risk have also been developed (8).

4. ADVANCES IN RESEARCH: THE FUTURE IS ALREADY HERE

Recent research is opening new therapeutic avenues for hypertension in diabetes and kidney disease. Innovative drugs are being developed that act through new mechanisms:

- Dual endothelin receptor antagonists »

GOOD BLOOD PRESSURE CONTROL IS JUST AS IMPORTANT AS BLOOD GLUCOSE CONTROL

CURRENTLY, WE HAVE TREATMENTS THAT NOT ONLY LOWER BLOOD PRESSURE BUT ALSO PROTECT THE KIDNEY AND THE HEART

SUMMARY OF ANTIHYPERTENSIVE TREATMENTS IN DIABETES AND CKD

TREATMENT	BP REDUCTION	RENAL PROTECTION	CARDIOVASCULAR BENEFIT
ACE inhibitors / ARBs	Yes (moderate)	Yes	Yes
SGLT2i	Yes (moderate)	Yes (reduces renal events)	Yes
Non-steroidal MRAs	Yes (moderate)	Yes (reduces renal events)	Yes (14% reduction in CV events)
GLP-1RA	Yes (moderate)	Yes (reduces renal events)	Yes (12–20% reduction in CV events)
Thiazide diuretics	Yes (moderate)	Limited	Not conclusive
Beta-blockers	Yes (variable)	Not significant	Yes (in selected cases)
Dual endothelin antagonists	Yes (15 mmHg SBP)	Yes (reduces proteinuria)	Under study
Aldosterone synthase inhibitors	Yes (11–13 mmHg SBP)	Under study (potentially yes)	Under study

BP blood pressure, ACE inhibitor angiotensin-converting enzyme inhibitor, ARB angiotensin II receptor blocker, SGLT2i sodium–glucose cotransporter-2 inhibitor, MRA mineralocorticoid receptor antagonist, CV cardiovascular, GLP-1RA glucagon-like peptide-1 receptor agonist, SBP systolic blood pressure.

» (such as aprocitentan): reduce BP and proteinuria. Clinical trials have demonstrated reductions of up to 15 mmHg in systolic pressure with good tolerance[9].

- Aldosterone synthase inhibitors (such as baxdrostat or lorundrostat): represent a new approach to BP control and kidney protection[10].
- Next-generation non-steroidal MRAs, such as KBP-5074, showing a lower incidence of hyperkalemia, making them particularly attractive for patients with advanced CKD.

These advances may transform the management of resistant hypertension in the near future, offering new hope for patients with multiple risk factors.

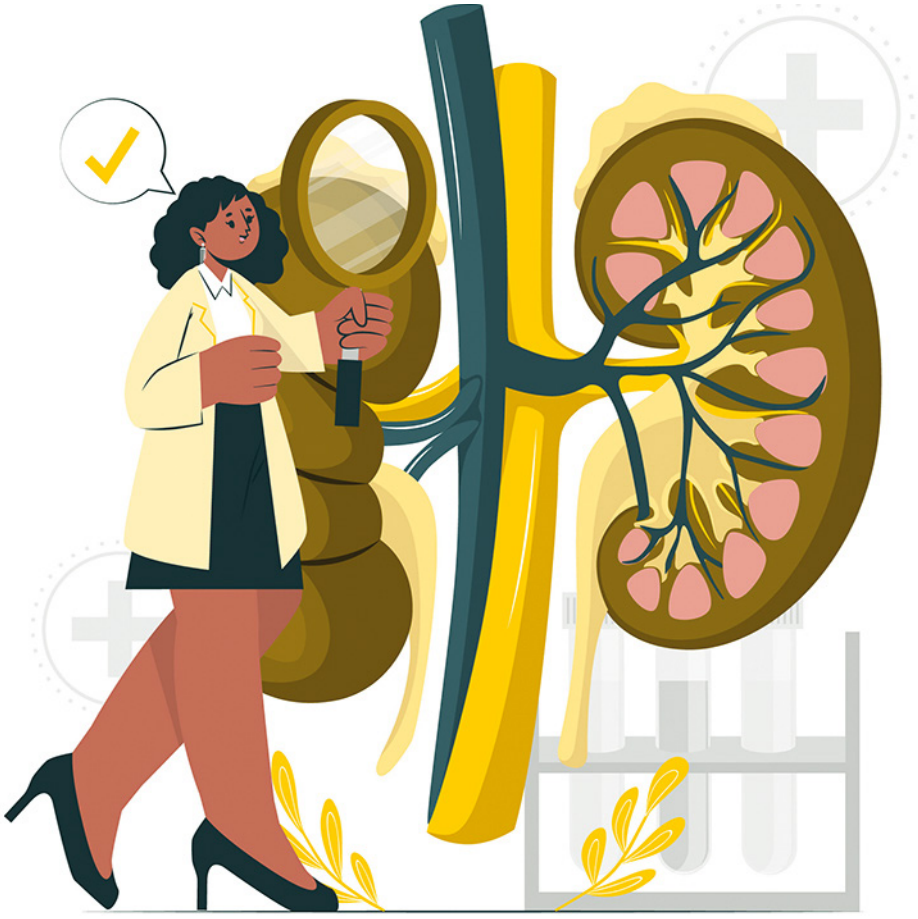
5. RENAL DENERVATION: A NON-PHARMACOLOGICAL OPTION

Renal denervation is a minimally invasive technique that partially eliminates sympathetic nerve terminals around the renal arteries. Performed via endovascular catheter, it has proven effective in certain cases of resistant hypertension, especially when significant sympathetic overactivity is present.

Recent studies have shown that in patients with T2DM and poorly controlled BP despite multiple medications, renal denervation can sustainably reduce BP. Some studies also suggest improvement in glycemic control and reduction in proteinuria, reinforcing its potential renal and metabolic benefits.

Currently, it is reserved for selected cases that do not respond to optimized pharmacological therapy and after ruling out secondary causes of hypertension. Although not a first-line option, it can be useful as part of an individualized approach in complex patients. D

THE APPROACH TO HYPERTENSION IN KIDNEY PATIENTS HAS MANY SYNERGISTIC ELEMENTS AND MUST BE INDIVIDUALIZED



CONCLUSIONS

Controlling blood pressure in people with diabetes and kidney disease is crucial to preventing serious complications. A personalized approach combining effective and safe treatments makes it possible to achieve BP targets while protecting both the heart and the kidneys. The incorporation of innovative therapies and non-pharmacological techniques such as renal denervation represents an opportunity to improve outcomes in these patients.

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