Hypertension and Chronic Kidney Disease

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1. Introduction

Hypertension is both an important cause and consequence of chronic kidney disease [1]. People who have hypertension are at an increased of adverse outcomes such as such loss of kidney function, kidney failure, accelerated progression of cardiovascular disease and premature death [1].Dialysis patient have 50-500times increased risk of cardiovascular disease (CVD) compared to age-marched individuals from the general population[2].Therefore, hypertension contributes to high cardiovascular morbidity and mortality [1].

2. Causes of Hypertension

Some of the interlinked mechanisms which can lead to hypertension in patients with CKD include [2]:

1. **Poor sodium regulation**

The inability to excrete sodium properly causes sodium and fluid retention resulting volume related hypertension.

2. **Increased sympathetic nervous system activity**

Sympathetic nervous system activity is increased CKD and this is thought to activate the hormone renin angiotensinogen. This in turn increases sodium reabsorption, fluid retention and vasoconstriction of all which increases blood pressure.

3. **Protein in urine**

Proteinuria is commonly seen in CKD which may cause raised blood pressure by pathway that increases sodium retention.

4. **Obesity**

CKD is common in patients with obesity. There is a well-described relationship between obesity and hypertension, although the mechanism for this is not fully understood.

5. **Other factors**

Medications can interfere with blood pressure control in patients with CKD.These medications include anti-inflammatory drugs, some decongestants and diet medications, oral contraceptives and herbal preparations containing ephedra.

3. HTN Management in Patients with CKD

The treatment of hypertension in CKD patients has three main goals which include blood pressure control, decreasing the risk of cardiovascular complications and delaying the progression of CKD itself [1].Hence, an optimal approach treatment and management of hypertension in those with CKD includes both pharmacologic and non-pharmacologic approach [6].

3.1 Non Pharmacological Therapy - Salt Restriction and Lifestyle Management

Given the fact the one of the main causes of CKD related to hypertension is increased extracellular volume (or exchangeable sodium); the role of dietary sodium restriction makes every sense [1]. Dietary sodium restriction is recommended to reduce extracellular fluid volume expansion and to lower blood pressure [5].A dietary sodium restriction can further enhances the effects of antihypertensive medications like angiotensin-converting enzyme inhibitors or angiotensin receptor blockers when treating HTN in CKD [3].Low salt dietary intake also augments the antiproteinuric effect of diuretics and renin-angiotensin aldosterone blocking drugs [3].Additionally, dietary sodium intake of less than 2.4 g/d (< 100mmgl.d) is recommended in most adults with CKD and hypertension. Dietary recommendations for adult patients are modified according to the stage of CKD [3]. Other lifestyle changes recommendation that is part of treatment regimen includes regular exercise, weight reduction and smoking cessation as part of comprehensive strategy of effective treatment of hypertension in CKD [4].

3.2 Pharmacological therapy-Antihypertensive Drugs

The need to employ anti-hypertensive drugs mainly in the late stages of the disease is mandatory in almost all the CKD patients [1]. Multiple drug regimens are important to control blood pressure levels adequately and slow down the progression of CKD [1].Antihypertensive therapy should be coordinated with other therapies as part of multi intervention strategy [2].Mechanisms of actions of antihypertensive drugs depends on the type and class of antihypertensive drugs [5].Different types, or classes, of anti-hypertensive drugs have different mechanisms of action. Diuretics increase sodium excretion and thiazide diuretics have become an integral element for treating hypertension in the early stages of CKD [1, 5]. Also, renin-angiotensin-aldosterone system (RAAS), inhibition is considered the cornerstone of management in patients with hypertension and CKD.Drugs such as Angiotensin II Receptor blockers and ACE inhibitors are vital as the first line therapy against RAAS inhibition[1,5].In addition, calcium channel blockers, aldosterone antagonists and bête-blockers are also well-established blood pressure reduction agents and in patients with CKD[1,5].

4. Conclusion

In conclusion, hypertension resulting from CKD is an important clinical concerning which has led to an increased risk in CKD progression and CVD mortality [1, 5]. A better understanding of the physiopathology mechanisms is vital in order to improve treatments strategies and to reduce any adverse effect and a wide range of therapeutic interventions and therapy can be chosen directed at achieving control of hypertension, keeping in mind the associated risk factors [1].

References

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