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Secondary Causes of Hypertension

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Secondary Causes of Hypertension

Christine L. Boutzale, MD

I. INTRODUCTION

Hypertension is one of the most common reasons for physician visits.¹ Of hypertensive patients presenting to primary care providers, 95% to 99% have essential hypertension. The remaining 1% to 5% of patients have an underlying diagnosis that is causing hypertension. Secondary hypertension has many etiologies; 5 of the most common will be examined in detail in this article, including renal artery stenosis, polycystic kidney disease, pheochromocytoma, primary aldosteronism, and Cushing's syndrome. Five case patients are presented to highlight the management of secondary hypertension. Although secondary hypertension only accounts for a few of the patients with hypertension, the high prevalence of hypertension in the United States makes this a substantial subset of patients. Even so, it is not cost-effective to screen every person for every cause of secondary hypertension. On the other hand, a secondary cause will not be found unless a high degree of suspicion is maintained. Certain symptoms or signs should lead a physician to evaluate more closely for underlying etiologies. These findings include high blood pressure starting before age 40 years or after age 50 years, sudden onset or acute increase in blood pressure, hypokalemia, associated renal dysfunction, or the presence of bruits (Table 1). Besides altering management, the elucidation of a secondary cause of hypertension is important because some of these causes are curable, thereby saving a patient from morbidity, potential mortality, and financial strain of long-term anti-hypertensive medication. Table 2 depicts the most common causes of secondary hypertension.

II. CASE PATIENT I

PRESENTATION

Patient 1 is a 72-year-old man who is referred for hypertension that has been difficult to control. The patient is currently on furosemide 60 mg daily and metoprolol 75 mg orally twice daily for treatment of his

hypertension. Despite this regimen, his blood pressure remains approximately 180/100 mm Hg. His body mass index (BMI) is 28 kg/m². He is a cigarette smoker despite multiple attempts at cessation. He sees an ophthalmologist yearly; at his most recent visit, he was diagnosed with grade III retinopathy. On physical examination, his neck veins are flat, his heart examination reveals an S₄ without murmurs, his lungs are clear, and an abdominal bruit is heard on the right. He has no edema in his lower extremities and distal pulses are intact. He insists that he is compliant with his medication regimen and that he "never uses salt." Serum chemistries reveal a normal electrolyte panel with blood urine nitrogen (BUN) of 20 mg/dL and a creatinine of 1.6 mg/dL. He has no known history of renal disease. His fasting glucose is normal.

- **At this time, what is the most likely cause of this patient's hypertension?**
 - A) Subclinical hypothyroidism
 - B) Renal artery stenosis (RAS) caused by atherosclerosis
 - C) RAS caused by fibromuscular dysplasia
 - D) Adrenal insufficiency
 - E) B or C

DISCUSSION

The correct answer is B. Of the etiologies listed, RAS caused by atherosclerosis is the most likely cause of hypertension in patient 1. Atherosclerosis is the most common cause of RAS, accounting for approximately 90% of cases.² It usually involves the proximal artery and may lead to total occlusion of the artery and to ischemic nephropathy. The stenosis progresses in about 50% of patients.³ RAS causes renovascular hypertension when the occluded artery leads to decreased renal perfusion; this activates the renin-angiotensin system leading to sodium retention, volume expansion, and hypertension. RAS is one of the most common causes of secondary hypertension but is still only estimated to occur in 1% to 5% of the general population of hypertensive patients.⁴ This percentage is higher when only patients with severe or malignant hypertension are considered. Patients with