

Refractory HTN: What are the options?

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Definitions

- Normal blood pressure: systolic <120 mmHg and diastolic <80 mmHg
- Pre-hypertension: systolic 120 to 139 mmHg or diastolic 80 to 89 mmHg
- Hypertension:
 - Stage 1: systolic 140 to 159 mmHg or diastolic 90 to 99 mmHg
 - Stage 2: systolic ≥ 160 or diastolic ≥ 100 mmHg

Therapeutic Reminders

- Angiotensin-converting enzyme (ACE) inhibitors/angiotensin II receptor blockers (ARBs)
- Calcium channel blockers
- Diuretics
- Beta blockers, which are now used less often for initial therapy in the absence of a specific indication for their use
 - Serial monotherapy recommended to start
- Angiotensin-converting enzyme (ACE) inhibitors/angiotensin II receptor blockers (ARBs) and Calcium channel blockers combination recommended for combination therapy
- Match agents with other indications/benefits
 - DM
 - CAD
 - LV systolic or diastolic dysfunction

Definitions

- Resistant HTN
 - HTN despite 3 antihypertensives (including diuretic) or controlled on >3 medications
- Refractory HTN
 - Uncontrolled on >3 medications (including diuretic) under the care of HTN specialist
- Pseudo-resistance
 - Inaccurate readings (too small cuff, etc.)
 - Poor or non-compliance with medication
 - White-coat HTN
 - Elevated office readings with reliable normal readings out-side office setting
 - Associated with lower risk of end-organ damage and complications

Risk Factors for Resistance

- Stage 2 baseline BP (especially systolic)
- LVH
- Advanced age
- Obesity
- African-American race
- Chronic renal insufficiency
- Diabetes

Considerations for Resistance

- Obesity, High Na diet, Sedentary lifestyle
- Heavy EtOH
- Medications:
 - NSAIDs
 - Diet pills, decongestants
 - Estrogen
 - Glucocorticoids
 - Anti-depressants
 - Cyclosporine, Tacrolimus

Secondary HTN Causes

- Primary Aldosteronism
 - Hypokalemia < 50% cases
- Renal Artery Stenosis
 - Renal bruit, Increase creatinine with ACEI/ARB
 - Atherosclerosis or Fibromuscular Dysplasia
- Chronic Kidney Disease
- Obstructive Sleep Apnea
 - Grossly under-recognized/diagnosed
- Less Common
 - Pheochromocytoma
 - Cushing's
 - Aortic Coarctation

Re-Evaluation

- History and ROS
 - Symptoms associated with Pheo or Cushings
 - Med compliance, cost, etc.
- Physical
 - Bruits – Atherosclerosis
 - BP differences arms/legs – Coarctation
- Laboratory
 - Chem 7
 - Proteinuria
 - Primary Aldosterone Screening
 - AM Plasma Aldosterone (elevated) and Renin (suppressed)
 - 24 urine Na excretion, creatinine clearance, aldosterone excretion
- Testing
 - Ultrasound renal arteries – accredited lab

Renal Revascularization

- Unilateral or Bilateral Disease
 - A short duration of blood pressure elevation prior to the diagnosis of renovascular disease - strongest clinical predictor of success
 - Failure of optimal medical therapy to control the blood pressure (>3-4 agents)
 - Intolerance to optimal medical therapy
 - Recurrent flash pulmonary edema and/or refractory heart failure
- Bilateral Disease - add
 - Otherwise unexplained progressive renal insufficiency

And if everything's negative?...

- Preferred regimen of an ACEI/ARB, long-acting dihydropyridine calcium channel blocker, and diuretic.
- If the current regimen includes a drug not from the three above drug classes, add the missing preferred drug and assess the response.
- If the patient is still hypertensive despite being treated with the three preferred drugs, add an aldosterone antagonist.
- Additional medications are added sequentially. Possible agents that may be used include
 - vasodilating beta blockers ([labetalol](#), [carvedilol](#), or [nebivolol](#)),
 - centrally acting agents ([clonidine](#) or [guanfacine](#)), and /or
 - direct vasodilators ([hydralazine](#) or [minoxidil](#)).

Experimental

- Catheter-based radiofrequency ablation of the renal sympathetic nerves
- Electrical stimulation of the carotid sinus baroreceptors

Thank You!

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