

# Update on Diagnosis and Treatment of Essential Hypertension 2018

# Case Study 1

- 63 year old white male presents for his annual check up. He reports increasing fatigue and shortness of breath with activity. His blood pressure, which was 170/88 one year ago, is now 240/130. he is reassured regarding his exam and instructed to get plenty of rest. One month later he is heard to say, “I have a terrific pain in the back of my head.” He loses consciousness and dies 30 minutes later. An autopsy reveals a large cerebral hemorrhage.

- The philosophies of one age have become the absurdities of the next, and the foolishness of yesterday has become the wisdom of tomorrow.

---William Osler

- Hypertension accounts for more CVD deaths than any other modifiable CVD risk factor and is second only to tobacco use as a preventable cause of death.

# Learning Objectives

1. Be aware of the new ACC/AHA guidelines defining hypertension.
2. Recognize the importance of home blood pressure measurement as opposed to office blood pressure.
3. Understand that white coat and masked hypertension are associated with increased CVD morbidity and mortality.
4. Know when to suspect and how to approach resistant hypertension.

- 2017 ACC/AHA guideline for the prevention, detection, evaluation and management of high blood pressure in adults.

# Case Study 2

- 63 year old male presents for routine physical exam. He is in good health and takes no prescription or OTC medications.
- He limits alcohol to 1 drink daily and exercises 4 days each week.
- He has no symptoms of OSA.
- Exam is normal except BP in both arms is 144/84 and confirmed with repeat testing.
- Lab is normal except LDL 142 and HDL 33.
- His 10 year CVD risk is 16% but he declines statin therapy.

- a. He has Stage 1 Hypertension but does not require medication at present.
- b. He has elevated blood pressure, should occasionally monitor outside readings and follow up in one year.
- c. He has elevated blood pressure, should be instructed on additional lifestyle modification and home monitoring and follow up in 6 months.
- d. He may have hypertension, should be instructed on additional lifestyle modification and home monitoring and follow up in 4-6 weeks.



# New Guidelines

	SBP	DBP
• Normal	<120	<80
• Elevated	120-129	<80
• Stage 1	130-139	80-89
• Stage 2	>140	>90

- Ambulatory blood pressure measurements are a stronger predictor of all-cause and cardiovascular mortality than clinic blood pressure measurements.
- White coat hypertension is not benign.
- Masked hypertension was associated with a greater risk of death than sustained hypertension.

--NEJM, April 2018

# Lifestyle Modification

- Weight loss
- DASH
- Sodium restriction
- Physical activity
- Moderate alcohol use

He agrees to limit sodium intake and begin home monitoring. He returns 6 weeks later. Office BP is 150/88, average of 12 home readings over the prior week is 136/84.

- a. He has Stage 1 hypertension but no indication for medication at present; continue lifestyle modification and follow up in 6 months.
- b. He has Stage 1 hypertension and should begin chlorthalidone.
- c. He has Stage 1 hypertension and should begin lisinopril.
- d. He has Stage 1 hypertension and should begin amlodipine.

# Indications for Medication

- BP >140/90 (or office BP >160/90)
- Diabetes or CKD
- Pre-existing CVD
- 10 year CVD risk >10%

# First Line Medications

- Thiazides – Chlorthalidone, not HCTZ
- ACE-I, ARB
- Calcium Channel Blockers (Dihydropyridone such as amlodipine preferred unless other indication for diltiazem, verapamil)

# How to Choose?

- Choice may be determined by co-existing condition (CHF, DM,CKD with proteinuria).
- Consider beginning with combination therapy if BP >20/10 above target.
- Thiazides and CCB more effective in blacks/older (>60).
- ARB and ACE-I more effective in younger (<50).

# How to Choose continued

- Combination of ACE-I/CCB may have better CVD outcome than ACE-I/diuretic.
- There is great individual variation in response to monotherapy. Consider sequential monotherapy to limit costs and improve compliance.
- Regardless of choice, patient must be followed every 4-6 weeks until goal BP is achieved.



- He reluctantly agrees to begin lisinopril and a statin. He reports BP readings monthly and eventually achieves BP <130/80 on 40 mg lisinopril.
- Two years later BP averages 135/85; Amlodipine added with initial improvement.
- Two years later BP home readings have increased to 140/90. Chlorthalidone is added with BP improving to 128/80.

Two years later BP is 150/90 on lisinopril 40 mg daily, amlodipine 10 mg daily and chlorthalidone 25 mg daily. He assures you he is compliant with all medications. Serum Cr and K<sup>+</sup> are normal.

- a. Begin clonidine 0.1 mg twice daily.
- b. Begin metoprolol 50 mg daily.
- c. Check plasma metanephrines.
- d. Check plasma aldosterone concentration and plasma renin activity.
- e. Perform duplex US of renal arteries.

# Medication Compliance and Number of Doses

- 79% 1 dose
- 69% 2 doses
- 65% 3 doses
- 51% 4 doses

# Resistant Hypertension

- Patient on 3 medications including diuretic and BP remains greater than 130/80.
- Causes
  - 1) Kidney Disease
  - 2) Renovascular Disease
  - 3) Primary Aldosteronism
  - 4) OSA
  - 5) Excessive Alcohol Use
  - 6) Pheochromocytoma
  - 7) Cushings Syndrome
  - 8) Aortic Coarctation

- Plasma aldosterone concentration is 18 with plasma renin activity  $<0.6$ . He was referred to nephrology; salt load testing performed confirming excessive aldosterone level. CT scan revealed no adrenal adenoma or carcinoma. He was placed on 25 mg spironolactone. BP remains well controlled on lisinopril, amlodipine, chlorthalidone and spironolactone.

- In patients with resistant hypertension, up to 20% may have hyperaldosteronism.

# Management of Hypertension in the Elderly??

The greater the ignorance, the greater the dogmatism.

--William Osler