11/20/23 Rafael Medina Subspecialty VMR with @CPSolvers

*"One life, so many dreams" **Case Presenter**: Dr. Melina Manolas (@melina_manolas) **Case Discussants**: Dr. Peggy Leung (@peggyleungmd)*

CC: 47 year old male presenting with difficult to control high blood pressure.

HPI:
Patient measures his blood pressure at home with an adequate cuff. It's usually around 140, the lowest being around high 130s and the highest around 150 systolic.

PMH:
HLD
Anxiety
HTN

Meds:
Amlodipine
Losartan
HCTZ

Allergies:
NKDA

Fam Hx:
Stroke 55 yo father.

Soc Hx:
No alcohol, tobacco, drug use. Walks outside several times per week. Low salt-diet.

Vitals: T: HR: 72 **BP:** 152/84 **RR:** 12 **SatO2:** 98% RA **BMI:** 24
Exam:
Gen: wnl **HEENT:** wnl
CV: RRR, no murmurs **Pulm:** CTAB **Abd:** soft, non tender

Notable Labs & Imaging:
Chemistry:
Na: 142 K: 3.3 Cl: 101 BUN: 22 Cr: 1.2 Glucose: 114
TSH & FT4: wnl
Plasma renin: 0.8 Plasma aldo: 18 (<15) Ratio: 22.5
Serum metanephrines wnl
Cortisol 8 am after suppression: 1.6 (<1.8)

Imaging:
Renal US: no artery stenosis
CT abd/pelvis from 1 year ago: within normal limits, normal adrenals.

Course:
Sent to Endocrinology
Repeat renin: < 1 Aldosterone: > 20 Ratio: > 20
CT with adrenal protocol: bl adrenal hyperplasia
Adrenal vein sampling: no lateralization

Patient started on spironolactone, very good BP control, although developed gynecomastia. Prior auth for eplerenone, with improvement.

Dx: Primary hyperaldosteronism

Problem Representation: 47 yo M p/w resistant HTN + hypokalemia, found to have hyperaldosteronism with bilateral adrenal hyperplasia and hyperfunction.

Teaching Points (Hui Ting):
[Goal for BP <130 and asymptomatic] Significantly less CV bad outcomes when BP is <120.
Re-check BP and making sure that home BP monitoring is accurate is the key. Make sure that the patient is seated properly when taking BP. *Recommended website for FDA approved BP devices: https://www.validatebp.org/*
[Home BP it is important to determine the type of HTN]: e.g. White coat HTN and masked HTN. If the BP is properly taken and it is elevated, specially in ambulatory setting. This correlates with higher probability of end organ disease. After the BP is accurately taken in the clinic and at home. Then proceed to think about the management → **[Lifestyle changes should be considered]:** Sodium intake relation with HTN → In a trial of group with 1000 mg sodium intake vs 500mg sodium intake→ The group with lower sodium intake showed positive results in reducing BP. Sleep and physical activity also has a positive relation in reducing BP. Alcohol and cocaine use is highly correlated with high BP.
It is important to check if they are on first line agent antihypertensive.
Resistant HTN: BP still not in the defined goal when on three antihypertensives. It is also important to consider if the patient is taking the recommended medications properly. If so, consider other underlying causes of secondary HTN. **[In patient taking regularly antihypertensive is to consider different causes]**:
1. Renal: (e.g. renal artery stenosis) in poorly controlled HTN, 40% CKD patients has resistant HTN. 2. Obstructive Sleep Apnea: 70-90% of patients with resistant HTN has OSA. 3. Endocrine: Primary hyperaldosteronism, acromegaly, Cushing Sx, Hypothyroidism.
Plasma aldo >20 (more suspicious to consider of hyperaldosteronism. Suppressed renin <1. Normal K does not rule out hyperaldosteronism. **PRC** (express the mass of renin). **PRA** (measure of plasma renin enzymatic activity. *This is preferred as test*, has less false-positive compared to PRC).
Spironolactone, amiloride, beta-blockers, clonidine can cause false raise of aldosterone.
Consider order cost-effective lab tests in primary care. Also it is important to consider the insurance status of the patient when ordering confirmatory tests and referring to specialists.
Next step management for primary hyperaldosteronism:
1. Referral to specialist is needed?
2. Adrenal venous sampling (AVS) is needed?

If renin is suppressed and is good surgical candidate → what is the aldosterone level, if >20, confirmatory testing is not needed → CAT scan → AVS → If unilateral (adrenalectomy), if bilateral (mineralocorticoid receptor antagonist therapy). If AVS is not accessible → Tx with spironolactone and get BP under controlled.
Teaching points: 1. Take accurate reading of BP and understanding the patient. 2. Have a BP goal in mind. 3. Think of secondary causes of HTN in cases of resistant HTN (in patient on multiple antihypertensive, consider screening for primary hyperaldosteronism).