

Endocrine Hypertension (Blood Pressure)

- There are many causes of high blood pressure, but one that is being appreciated in recent years is that caused by hormone secretions.
 - Excess adrenaline (pheochromocytoma)
 - Excess thyroid hormone (thyrotoxicosis)
 - Excess aldosterone
 - Excess cortisol (Cushing syndrome)
- The most common cause of endocrine mediated hypertension is excess aldosterone, which is made in the adrenal gland.
 - Because it is so common, we recommend patients be screened if they have any of the following:
 - Blood pressure > 140/90
 - Take 3 or more blood pressure medications but still have blood pressure > 140/90
 - Require 4 medications to control blood pressure OR
 - High blood pressure AND low potassium OR
 - High blood pressure AND an adrenal nodule OR
 - High blood pressure AND sleep apnea OR
 - Family members with early onset high blood pressure or early stroke
 - A parent or sibling with excess aldosterone
- The adrenal glands are like “top hats” on the kidneys, their job is to produce different kinds of steroid hormones, especially cortisol & adrenaline.
 - These hormones are **necessary for life** because they regulate stress responses that control blood pressure and how our cells use glucose.
 - But the glands also make other kinds of hormones like aldosterone, which regulates certain electrolytes, or sex hormones.
- Because we do so many CAT scans for other reasons, we often find nodules in glands “by accident” and these are called incidentalomas.
 - If we find one of these nodules, we always check it for aldosterone.
- Sometimes patients take blood pressure medications that interfere with the tests for aldosterone, so we want to switch or stop those medications for 4-6 weeks before testing.
- What tests will check for aldosterone?
 - First we make sure you have potassium supplements if you need them. After potassium is normal we start phase 1 testing.
 - An 8 am blood test for aldosterone and renin. We use the ratio of the two to determine the need for additional testing.
- How do the confirmatory tests work?
 - If the ratio of aldosterone-to-renin is at least 20, especially if the aldosterone level is > 15, we start phase 2 of testing.
 - The patient needs to eat about 6000mg sodium every day for 3 days.

- The easiest way to do this is to add 3 cans of soup to your diet every day for 3 days. There are salt tablets, but they can be expensive and make people feel sick.
- On the start of the 3rd day, continue the high sodium diet & collect urine for 24 hrs. We will check this for both sodium and aldosterone. If the sodium is > 200 and the aldosterone is > 12 mcg we diagnose primary hyperaldosteronism.
- Only if the labs are positive for aldosterone will we check a CAT scan of the adrenal glands.
 - If a nodule is detected, we will refer to a specialized facility to check the adrenal veins, which will tell us if that nodule is actually making the aldosterone.
 - If the nodule IS making aldosterone, the best treatment is to take it out.
 - Most people who have their aldosterone-secreting nodule removed can come off of their blood pressure medications after the surgery.
 - If NO nodule is found, the excess aldosterone can be treated with a medication, either spironolactone or eplerenone.
- What if my CAT scan shows nodules on BOTH sides?
 - Usually the safest way to treat this is with the spironolactone or eplerenone, and outcomes are very good long-term.
- What if my CAT scan showed NO nodules, but the glands look bigger than expected?
 - We call this hyperplasia. Sometimes this means there's a tiny nodule in there, but other times it just means the adrenal glands have more cells than usual. The treatment is the same: spironolactone or eplerenone.

Resources

- Columbia Adrenal Center:
<http://columbiasurgery.org/conditions-and-treatments/primary-hyperaldosteronism-conns-syndrome>
- Endocrine Surgeons: <http://endocrinediseases.org/adrenal/hyperaldosteronism.shtml>
- Mayo Clinic www.mayoclinic.org
 - Benign adrenal tumors
 - Primary aldosteronism