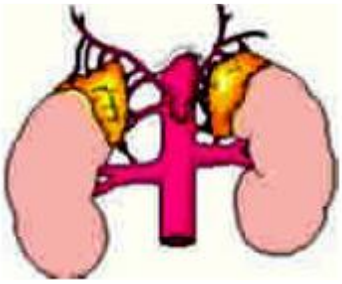
HELLENIC MINISTRY OF HEALTH
EVANGELISMOS-POLIKLINIKI GENERAL HOSPITAL
DEPARTMENT OF ENDOCRINOLOGY "D.IKKOS"
CENTER OF EXCELLENCE FOR RARE ENDOCRINE DISEASES

ADRENAL GLANDS

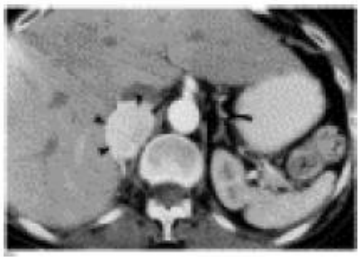


Located at the top of each kidney, the adrenals are two small endocrine glands that consist of the outer cortex (producing cortisol, aldosterone and androgens) as well as the inner medulla (producing adrenaline and noradrenaline).
Adrenal glands help the body to control blood sugar, burn protein and fat, react to stressors like a major illness or injury, and regulate blood pressure.
Adrenal diseases are either due to insufficient production of a particular adrenal hormone or sometimes the adrenal glands develop nodules (adenomas) that produce hormones causing the following diseases:

- **Cushing's syndrome**

Cushing's syndrome consists of the physical and mental changes that result from having too much cortisol in the blood for a long period of time. Its characteristic symptoms are the following:

- ✓ Weight gain, especially in the upper body
- ✓ Rounded face and extra fat on the upper back and above the collarbones
- ✓ Muscle weakness
- ✓ Thin, fragile skin that bruises easily
- ✓ Purple-red stretch marks (usually over the abdomen)
- ✓ High blood sugar (diabetes)
- ✓ High blood pressure (hypertension)
- ✓ Thin bones (osteoporosis)
- ✓ Depression
- ✓ Too much facial hair, menstrual disturbances (women)



- **Primary aldosteronism**

Primary aldosteronism is due to aldosterone excess that results in high blood pressure, low potassium level in the blood (hypokalemia) as well as water and sodium retention.

- **Pheochromocytoma**

Pheochromocytoma is a rare adrenal tumor that leads to overproduction of adrenaline and/or noradrenaline. It can be hereditary and bilateral. Symptoms of too much adrenaline or noradrenaline can include:

- ✓ Fast or irregular heartbeat
- ✓ Sweating
- ✓ Severe headaches
- ✓ High blood pressure.

If your doctor suspects hormone hypersecretion by an adrenal adenoma, he will ask you to measure the specific hormones in your blood or urine and, if necessary to perform a CT scan. In some cases, it may be necessary to perform a special scintigraphy, or to perform a more invasive examination called adrenal vein catheterization.
The treatment is surgical, usually laparoscopic, except in special cases, eg, large adrenocortical carcinoma. In this case, after surgery, mitotane treatment or a chemo-therapeutic regimen is needed.

- **Primary adrenal insufficiency (AI) (Addison's disease)**

In some cases, the adrenal cortex is destroyed (usually by autoimmunity). As a result, adrenal glands cannot produce cortisol and aldosterone. Symptoms appear gradually and include:

- ✓ Fatigue and dizziness due to low blood pressure
- ✓ Unexplained weight loss
- ✓ Craving for salt
- ✓ Darkened skin (pigmentation)
- ✓ Menstrual disturbances (women)

Physical stress caused by illness, infection, surgery, or an accident can suddenly make symptoms of AI much worse, leading to an emergency illness called an adrenal crisis.
Early diagnosis is of great importance and treatment includes lifelong replacement with cortisone and fludrocortisone. Your doctor will give you "the adrenal insufficiency card" with instructions on when to take a larger dose that you should always bring with you.

- **Congenital adrenal hyperplasia (CAH)**

This is an inherited disease with decreased cortisol and/or aldosterone and increased production of androgens. Classic CAH, is presented with hypoglycemia and low blood pressure (due to cortisol and aldosterone deficiency) soon after delivery. Female infants are usually diagnosed at birth, because they have ambiguous genitalia as a result of androgen excess during pregnancy (external sex organs that resemble male genitals). Treatment is similar as in adrenal insufficiency.
Unlike classic CAH, the non-classic form is mild. In this case, adolescent girls present with increased facial hair, acne, menstrual irregularity and infertility. Treatment which includes hydrocortisone or estrogen and progesterone, will be decided after discussion with your doctor.