

PRIMARY ADRENAL INSUFFICIENCY (ADDISON'S DISEASE)

THE FACTS YOU NEED TO KNOW



What is Primary Adrenal Insufficiency?

Primary Adrenal Insufficiency, also called Addison's disease, is a severe or total deficiency of the hormones made in the adrenal cortex, caused by its destruction.

There are normally two adrenal glands, located one above each kidney. The adrenal glands are really two endocrine (ductless or hormone producing) glands in one.

The inner part of the adrenal gland (called the medulla) produces epinephrine (also called adrenaline) which is produced at times of stress and helps the body respond to "fight or flight" situations by raising the pulse rate, adjusting blood flow, and raising blood sugar. However, the absence of the adrenal medulla and epinephrine does not cause disease.

In contrast, the outer portion of the adrenal gland, the cortex, is more critical. The adrenal cortex makes two important steroid hormones.

CORTISOL mobilizes nutrients, modifies the body's response to inflammation, stimulates the liver to raise the blood sugar, helps to control the amount of water in the body.

ALDOSTERONE regulates salt and water levels which affects blood volume and blood pressure

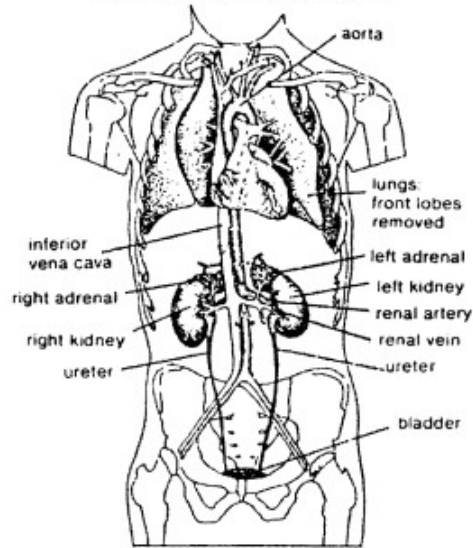
The adrenal cortex also makes a weak androgen, DHEA, that is not critical for life.

Classical Addison's disease results from a loss of both cortisol and aldosterone secretion due to the near total or total destruction of both adrenal glands. This condition is also called primary adrenal insufficiency.

Cortisol production is regulated by another hormone, adrenocorticotrophic hormone (ACTH), made in the pituitary gland which is located just below the brain.

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Location of the Adrenal Glands



What Causes Addison's Disease?

The major cause of Primary Adrenal Insufficiency (Addison's disease) results from an autoimmune reaction in which the body's immune system erroneously makes antibodies against the cells of the adrenal cortex and slowly destroys them. That process takes months to years.

Other causes:

- Tuberculosis (leading cause until mid 20th century), other infections including fungal
- Invasion of metastasized cancer cells (breast and other)
- CMV virus in association with AIDS
- Hemorrhage into the adrenals during shock (more rare)
- Surgical removal of both adrenals

What are the symptoms of Addison's Disease?

1. A chronic, steadily worsening fatigue, loss of appetite, and some weight loss.
2. Blood pressure is low and falls further when a person is standing, producing lightheadedness.
3. Nausea, sometimes with vomiting, and diarrhea are common.
4. The muscles are weak and often go into spasm.
5. There are often emotional changes, particularly irritability and depression.
6. Because of salt loss, a craving for salty foods is common.
7. Increase in ACTH due to the loss of cortisol will usually produce a darkening of the skin that may look like an inappropriate tan on a person who feels very sick.

Unfortunately, the slowly progressive chronic symptoms are usually missed or ignored until an unexpected event like a flu virus, an accident, or the need for surgery suddenly precipitates a dramatic change for the worse because of the deficient response from the adrenals to one of these stresses. This is referred to as an adrenal crisis and is a medical emergency.

How is Addison's Disease diagnosed?

A medical history of the symptoms mentioned above, as well as hyperpigmentation of the skin and/or gums, is often enough to raise a strong suspicion, prompting the appropriate tests. Quite often, however, the first clue is from the abnormal results of routine tests done in a hospital or doctor's office. These may include:

- An elevated blood level of potassium, a low blood level of sodium
- A shift in the ratio of certain white blood cells
- Surprising changes on an EKG or chest x-ray that are caused by high potassium or low blood volume (Other causes for these changes, particularly from medications, must be considered first.)

A definitive diagnosis of Addison's disease requires that definitive tests be carried out.

- Measure the amount of cortisol and aldosterone in the blood and urine.
- Document a lack of the normal increase in the levels of these two hormones after administration of ACTH given by injection.
- An elevated blood level of ACTH should also be found.

If the patient is very sick and Addison's disease is suspected, treatment can be initiated while the diagnostic tests are being done.

Once the diagnosis of Addison's disease is established, an effort should be made to find the cause by checking for tuberculosis and other infections through skin tests and x-rays. Antibodies to adrenal tissue, especially to 21OH can now be measured, and are specific to autoimmune Primary Adrenal Insufficiency.

How is Addison's Disease Treated?

Since all of the manifestations of Addison's disease are caused by the lack of cortisol and aldosterone, the treatment is to replace these with similar steroids.

CORTISOL is usually replaced orally by hydrocortisone, less often with prednisone tablets, divided into 2–3 doses. (Sometimes a combination.)

ALDOSTERONE is replaced by an aldosterone-like synthetic steroid, fludrocortisone (Florinef®) tablets given once daily.

The doses of each of these medications are adjusted for the individual's size and any coexisting medical conditions.

Replacement of DHEA is optional and has mild benefits.

In emergencies or during surgery, hydrocortisone must be given intravenously.

STRESS-DOSING and EMERGENCIES — Patients with Addison's disease should be taught to treat minor illnesses with extra hydrocortisone, along with extra salt and fluids. This is especially important if fever, vomiting or diarrhea is present. Persistence of these signs requires immediate treatment in an emergency room with intravenous hydrocortisone and saline (salt water). Patients should be prescribed an injectable form of hydrocortisone (Solu-Cortef) and syringes to be used in emergency situations while waiting to be transported to an emergency room.

Since Primary Adrenal Insufficiency (Addison's disease) is a chronic condition, daily replacement medication can never be stopped.

Proper maintenance treatment requires regular visits to a physician for examinations, laboratory tests, and discussions about symptoms. Certain blood tests, including sodium, potassium, blood counts and plasma renin are very useful in monitoring the response to adjustments in dosage. There is no single blood or urine test that is perfect by itself.

Why should Addisonians consult an Endocrinologist?

Endocrinologists are specialists in hormonal diseases, including Addison's disease. Because of the rarity of the disease, an endocrinologist will have more training and experience in properly diagnosing and treating Addison's disease than most physicians.

Are there related diseases?

SECONDARY ADRENAL INSUFFICIENCY — caused by a lack of ACTH, resulting in deficiency of cortisol, but usually not aldosterone. The cause is either pituitary disease, such as a tumor, or the prolonged use of “steroid” medication that suppresses ACTH. The treatment is simply to replace cortisol, usually with hydrocortisone, but sometimes with the synthetic steroid prednisone.

OTHER AUTOIMMUNE DISEASES — Primary Adrenal Insufficiency (Addison’s) can be associated with other autoimmune diseases that similarly affect other endocrine glands. The most common one is the thyroid. If an underactive thyroid (hypothyroidism) coexists with Addison’s disease, this is called Schmidt’s syndrome.

Less commonly associated autoimmune diseases are insulin-dependent diabetes mellitus and insufficiencies of the parathyroid glands, gonads, and vitamin B12 absorption (pernicious anemia).

Why is Addison’s considered a rare disorder?

There are no accurate statistics on the incidence of Addison’s disease in the United States. One estimate from the National Organization of Rare Diseases (NORD) is 1 in 100,000. They put the prevalence at 40-50 people living with Addison’s disease per million population.

How normal is an Addisonian’s life?

As long as the proper dose of replacement medication is taken every day, an Addisonian can have a normal crisis-free life. There are no specific physical or occupational restrictions.

Routine care includes regular physician visits, avoidance of dehydration, and the use of extra medication during illness. Pregnancy is possible, but will require extra monitoring of the replacement medication.

Every Addisonian should wear an identification bracelet stating that he or she has the disease, to insure proper emergency treatment. An identification card outlining treatment is also suggested.

Primary Adrenal Insufficiency (Addison’s disease) should have a normal life expectancy.

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The National Adrenal Diseases Foundation is a non-profit organization providing information, education and support to all persons affected by adrenal disease. For more information on joining NADF, or to find a support group in your area, contact:

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