ADDISON'S DISEASE

This information sheet is for your general information and is not a substitute for medical advice. You should contact your doctor or other healthcare provider with any questions about your health, treatment or care.

What is Addison's disease?
Addison's disease is an endocrine (hormonal) condition that occurs when the adrenal glands (small gland located on top of the kidney) do not produce enough cortisol (a hormone that controls carbohydrate metabolism, the immune system and maintains blood pressure) and, in some cases, the hormone aldosterone (a hormone made by the outer portion [cortex] of the adrenal gland that regulates the balance of salt and water in the body).

This condition is also known as *adrenal insufficiency* or *hypocortisolism*. The most important function of cortisol is to help the body respond to stress. Cortisol also helps to maintain blood pressure, slows the immune system's inflammatory response, balances the effects of insulin and regulates the metabolism. Aldosterone belongs to a class of hormones called mineralocorticoids, which is also produced by the adrenal glands. It helps maintain blood pressure and the water and salt balance in the body by helping the kidney retain sodium and excrete potassium.

Addison's disease is most common among people aged 30 to 50, but it can occur at any age and affects men and women equally.

Symptoms of Addison's disease
The symptoms of adrenal insufficiency usually begin gradually. General symptoms of the condition include:

- chronic, worsening tiredness
- muscle weakness
- loss of appetite
- weight loss
- nausea
- vomiting
- diarrhoea
- salt craving
- low blood pressure that drops further when standing up, causing dizziness or fainting
- skin changes in Addison's disease, with areas of hyperpigmentation or dark tanning covering exposed and non-exposed parts of the body; this darkening of the skin is most visible on scars, skin folds, pressure points such as the elbows, knees, knuckles and toes, as well as the lips and mucous membranes
- irritability and depression
- hypoglycaemia (low blood glucose), which is more severe in children than in adults; in women, menstrual periods may become irregular or stop.

A stressful event, such as an illness or an accident may cause symptoms to worsen. This is known as an Addisonian crisis or acute adrenal insufficiency.

Symptoms of an Addisonian crisis include:

- a sudden penetrating pain in the lower back, abdomen or legs
- severe vomiting and diarrhoea
- dehydration (excessive loss of body fluid)
- low blood pressure
- loss of consciousness.

If left untreated, an Addisonian crisis can be fatal.

What causes Addison's disease?
Failure to produce enough levels of cortisol can occur for different reasons. The problem may be due to a disorder of the adrenal glands themselves, known as *primary adrenal insufficiency,* or to incomplete secretion of the adrenocorticotropic hormone (ACTH) by the pituitary (main endocrine) gland, known as *secondary adrenal insufficiency*. The pituitary gland is a small structure in the head and is called the master gland because it produces hormones that control other glands and many body functions, including growth.

1. Primary adrenal insufficiency

Primary adrenal insufficiency is the gradual destruction of the adrenal cortex (the outer layer of the adrenal glands) by the body's own immune system. Approximately 70% of reported cases of Addison's disease are caused by auto-immune disorders, in which the immune system produces antibodies that attack the body's own tissues or organs and slowly destroy them.

Polyendocrine deficiency syndrome

Polyendocrine deficiency syndrome is characterised by repeated or multiple deficiencies in the function of several endocrine glands that have a common cause. Polyendocrine deficiency syndrome is classified into two separate forms, referred to as type I (occurs in children) and type II (occurs in young adults). Scientists believe polyendocrine deficiency syndrome is inherited, because quite often more than one family member of the patient tends to have one or more endocrine deficiencies.

Tuberculosis

Tuberculosis (TB) is an infection that can destroy the adrenal glands and cause primary adrenal insufficiency. As the treatment for TB improves, the occurrence of adrenal insufficiency due to TB of the adrenal glands is greatly decreased.

Other causes

Less common causes of primary adrenal insufficiency are:

- chronic infection – mainly fungal
- cancer cells spreading from other parts of the body to the adrenal glands
- amyloidosis (disorder usually associated with chronic conditions such as rheumatoid arthritis, TB and multiple myeloma)
- surgical removal of the adrenal glands.

2. Secondary adrenal insufficiency

This form of adrenal insufficiency is much more common than primary adrenal insufficiency and can be traced to a lack of ACTH. A temporary form of secondary adrenal insufficiency may occur when a person who has been receiving a glucocorticoid hormone for a long time suddenly stops taking the medication or interrupts the treatment for rheumatoid arthritis, asthma or ulcerative colitis.

Another cause of secondary adrenal insufficiency is the surgical removal of non-cancerous, ACTH-producing tumours of the pituitary gland (Cushing's disease) and, less commonly, when the pituitary gland either decreases in size or stops producing ACTH.

Diagnosis of Addison's disease
Your doctor will perform laboratory tests to determine whether you have Addison's disease. These tests include:

Blood tests

Tests that measure the levels of sodium, potassium, cortisol and ACTH in your blood can help your doctor determine whether an adrenal insufficiency is causing your symptoms. Your doctor can also measure antibodies associated with auto-immune disorders that can cause Addison's disease.

ACTH stimulation test

Your doctor may test your body's ability to secrete cortisol in response to an injection of artificial ACTH to find out if your adrenal glands are damaged. In a healthy person, cortisol levels rise after the ACTH injection.

Insulin-induced hypoglycaemia test

If your doctor suspects pituitary gland disease, he or she may test your blood sugar and cortisol levels at various points after an injection of insulin. Normally, glucose levels fall and cortisol levels rise after an insulin injection.

Imaging tests
Your doctor may want to do a computerised tomography (CT) scan to check the size of your adrenal glands or pituitary gland and look for abnormalities that could help identify the cause of your adrenal insufficiency.

Treatment of Addison's disease
Treatment of Addison's disease involves replacing or substituting the hormones that the adrenal glands are not producing. Cortisol is replaced with hydrocortisone tablets, which are taken orally once or twice a day. If aldosterone is not present either, it is replaced with oral doses of a mineralocorticoid (a group of hormones that regulates the balance of water and electrolytes [ions such as sodium and potassium] in the body) called fludrocortisone acetate (used primarily to replace the missing hormone aldosterone), which is taken once a day.

Your doctor may also recommend you take an androgen (male sex steroid hormone) replacement called dehydroepiandrosterone (DHEA), a steroid hormone made by the adrenal glands. Some women with Addison's disease find that taking replacement androgen improves their overall sense of wellbeing, libido and sexual satisfaction.

If you are experiencing an Addisonian crisis, you need immediate medical care. The treatment typically consists of intravenous (IV) injections of hydrocortisone, saline (salt water) and dextrose (sugar).

General information

Surgery
Patients with chronic adrenal insufficiency who need surgery under general anaesthesia are treated with injections of hydrocortisone and saline.

Pregnancy
Pregnant women with primary adrenal insufficiency are treated with standard hormone replacement therapy. If nausea and vomiting in early pregnancy interfere with oral medication, injections of the hormone may be necessary.

Medical alert card and bracelet
Carry a medical alert card and/or bracelet at all times. In the event that you become ill and helpless, emergency medical personnel will know what kind of care you need.

Keep extra medication handy
Missing even one day of treatment may be dangerous, so it's a good idea to keep a small supply of medication at work and in your travel bag. Have your doctor prescribe a needle, syringe and injectable form of corticosteroids to have with you in case of an emergency.

Your doctor
Maintain an ongoing relationship with your doctor to ensure that the doses or replacement hormones are sufficient. If you have ongoing problems with your medication, you may need to change the dose or timing of the medication.

If you have been diagnosed with Addison's disease, you should also know how to increase medication during periods of stress or mild upper respiratory infections. Immediate medical attention is needed when severe infections, vomiting or diarrhoea occur. These conditions can bring on an Addisonian crisis. A patient who is vomiting may require injections of hydrocortisone.

References

1. MAYO CLINIC. 4 December 2012. *Addison's disease*. Website: www.mayoclinic.org.
2. UPTODATE. Website. http://www.uptodate.com/home/index.html.