

Thyroid disorders - hyperthyroidism

Around one in 20 people will experience some form of thyroid dysfunction in their lifetime. The thyroid gland is part of the endocrine system, which secretes regulatory hormones into the blood. The thyroid sits just below the Adam's apple (larynx) and has two lobes, one on either side of the windpipe. This gland controls many vital metabolic processes, such as growth and energy expenditure.

An overactive thyroid is known as hyperthyroidism, and this condition tends to affect women more than men. Around two in every 100 women will experience some degree of hyperthyroidism. The most common cause is Graves' disease, which is due to an immune system abnormality. Other causes of an overactive thyroid include local inflammation (thyroiditis), nodules or lumps. There is no cure for hyperthyroidism, but it can be successfully managed with treatments such as anti-thyroid medication.

Symptoms

The symptoms of hyperthyroidism include:

- Accelerated heart rate or palpitations
- Muscle weakness and trembling
- Unexplained weight loss
- Sensitivity to heat
- Diarrhoea
- Sleeping difficulties
- Sweating
- Irritability
- Nervousness, agitation and anxiety
- Changes in menstruation, including scantier flow and increased cycle length.

Thyroid hormones

The thyroid gland produces the hormones thyroxine (tetra-iodothyronine) and tri-iodothyronine, which set the body's metabolic rate. The more of these hormones in the blood, the faster the metabolism. The hormones are referred to as T4 and T3 respectively, reflecting the number of iodine atoms in each hormone. The body needs about 150mcg of iodine a day to allow the thyroid to make sufficient hormones. The pituitary gland in the brain regulates the production of the hormones by releasing a chemical called thyroid stimulating hormone (TSH).

Graves' disease

The most common cause of hyperthyroidism is Graves' disease. An abnormality of the immune system is the cause. The immune system is a collection of special cells and chemicals that fight infection from foreign agents, such as bacteria and viruses. A key element of the immune system is the antibody, which is a type of tailor-made 'poison' produced by lymphocytes (white blood cells) to kill a particular foreign agent. In a person with Graves' disease, the immune system manufactures antibodies which behave like TSH and stimulate the thyroid uncontrollably. Less than one per cent of the population has Graves' disease. Eight times more women than men have this condition. Graves' disease is more common in middle age, although children and adolescents can also be affected.

Causes of Graves' disease

No one really knows what causes Graves' disease because the causes of autoimmunity are not fully understood. Stress, both physical and emotional, is known to affect the responsiveness of the immune system and there appears to be some association between stress and the onset of autoimmune conditions - including Graves' disease. Autoimmune conditions have a distinct genetic element, with some family lines having multiple cases of Graves' disease and other autoimmune conditions. It is likely that some people's genetic inheritance could predispose them to Graves' disease. Another cause is excessive iodine intake. X-ray contrast mediums and a number of disinfectants contain a lot of iodine and can trigger Graves' disease in susceptible people.

Symptoms of Graves' disease

As well as the general symptoms of hyperthyroidism, a person with Graves' disease shows particular symptoms including:

- Thyroid eye disease, causing inflammation and protruding eyes in 50 per cent of cases
- Eye swelling (50 per cent of cases)
- Coarsening and reddening of the skin on the shins.

Diagnosis

Hyperthyroidism can be diagnosed with a simple blood test that measures thyroid hormone levels. A person with hyperthyroidism has high levels of thyroxine, but low levels of TSH. The presence of thyroid stimulating antibodies can also be checked and, if present, confirms a diagnosis of Graves' disease. If the hyperthyroidism is due to nodules, a radioactive scan of the thyroid will indicate isolated pockets of overactivity.

Treatment options

There is no cure for hyperthyroidism, but there are ways to successfully manage the condition, including:

- **Medication** - the thyroid gland relies on iodine to make the thyroid hormones. Anti-thyroid drugs work by interfering with the gland's ability to use iodine. Around one in four people will experience a prolonged period of remission after one year or more of anti-thyroid medication. Side effects of the medications include skin rashes and joint pain. Patients on these drugs who experience fever or flu-like symptoms should see their doctor immediately, as the drugs can suppress the immune system.
- **Radioiodine therapy** - radioactive iodine is taken as a drink. The iodine is taken up by the active cells in the thyroid, which are then killed. Other cells do not absorb the iodine. The radioactive iodine is then excreted in the urine with no reported side effects. One dose is usually sufficient to control hyperthyroidism, but one or two subsequent treatments may be required. Patients should avoid contact with adults for a few days and with children and pregnant women for a longer period.
- **Surgery** - some or all of the thyroid gland is surgically removed under general anaesthesia. There are normal surgical risks associated with this procedure, as well as the possibility of damaging the parathyroid glands (which lie next to the thyroid gland) and the nerve supplying the vocal cords.

From overactive to underactive

A person who has had hyperthyroidism should have his or her thyroid hormone levels (TSH, T4 and T3) checked on a regular basis. This is because most people who are treated for hyperthyroidism eventually develop hypothyroidism. The treatment causes the thyroid to become underactive. The symptoms include lethargy, unexpected weight gain, constipation and sensitivity to the cold. Underactivity is treated by hormone replacement with thyroxine tablets.

This switch from overactive to underactive can seem like treatment simply replacing one condition with another, but underactivity is easily treated with hormone replacement without side effects, whereas untreated overactivity is a serious condition which invariably proves fatal if allowed to persist.

Where to get help

- Your doctor

- Endocrinologist.

Things to remember

- The thyroid gland controls important metabolic processes such as growth and energy expenditure.
- Hyperthyroidism means the thyroid gland is overactive.
- An immune system abnormality called Graves' disease is the most common cause of hyperthyroidism.
- People treated for hyperthyroidism normally end up with an underactive thyroid - which is called hypothyroidism.

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Thyroid Australia

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