
Cushing's syndrome

Summary

- Cushing's syndrome is a collection of hormonal disorders resulting from high levels of the hormone cortisol.
 - Many overweight people with hypertension or diabetes have some features of Cushing's syndrome. Tests can be done to rule out this possibility.
 - Causes include certain tumours and glucocorticoid drug therapy for inflammatory disorders.
 - Without treatment, Cushing's syndrome can be fatal.
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Cushing's syndrome is a collection of hormonal disorders characterised by high levels of the hormone cortisol. Another name for Cushing's syndrome is hypercortisolism. Some people have Cushing's syndrome symptoms when they take glucocorticoid hormones to treat inflammatory conditions such as asthma, lupus or rheumatoid arthritis.

Other causes include tumours of the pituitary and adrenal glands, and tumours in other areas of the body. Around one in 50,000 people are affected by Cushing's syndrome, with females more susceptible to some forms than males. Without treatment, the disorder can be fatal.

Many overweight people with hypertension or diabetes have some features of Cushing's syndrome. Tests can be done to rule out this possibility.

Symptoms of Cushing's syndrome

Some of the symptoms include:

- Weight gain around the abdomen, and obesity
- Wasting of the limbs
- A 'buffalo' hump of fat high on the back
- Round, red and puffy-looking face ('moon face')
- Thin skin, easily bruised, slow healing and ulcers
- Muscular weakness
- Thirst
- Frequent urination
- Headaches
- High blood pressure
- High white blood cell count, low serum potassium
- High blood sugar (in 80 per cent of patients)
- Mood swings, irritability, anxiety, depression
- Impotence
- Irregular menstrual periods or no menstrual periods
- Increased facial hair in women
- Weakened bones, susceptibility to bone fractures (especially in ribs and spine), osteoporosis and backache
- Susceptibility to pneumonia and TB.

The hormone cortisol

Cortisol is made by the adrenal glands. When cortisol levels are too low, the pituitary secretes the stimulating hormone adrenocorticotropin (ACTH). High levels of cortisol prompt the pituitary to decrease ACTH, which slows

cortisol production.

Cortisol is essential to life. Its functions include:

- Helping the body manage stress
- Helping to maintain constant blood sugar levels
- Inhibiting inflammation
- Contributing to the maintenance of constant blood pressure
- Contributing to the workings of the immune system.

Causes of Cushing's syndrome

The symptoms of Cushing's syndrome are caused by damage to body tissues due to high levels of the hormone cortisol in the blood over a long time. The disorders that trigger high cortisol levels include:

- Tumour of the pituitary gland
- Tumour of the adrenal gland
- ACTH-producing tumours (ectopic) elsewhere in the body
- Multiple endocrine neoplasia 1 (MEN1)
- Glucocorticoid hormone therapy.

Tumour of the pituitary gland

This form is known as Cushing's disease and accounts for about seven in 10 cases of Cushing's syndrome. One type of pituitary gland tumour secretes additional ACTH, which forces the adrenal glands to make too much cortisol.

These tumours are usually benign non-cancerous adenomas and they occur more often in women than men (3 to 1). Complications include diabetes, kidney stones and mental disturbances, such as psychosis.

Tumour of the adrenal gland

A tumour on one of the adrenal glands triggers the production of high cortisol levels. The tumours are usually non-cancerous. The pituitary responds by dropping its level of ACTH hormone, which causes the healthy adrenal gland to shrink. Onset of symptoms can be quite rapid.

ACTH-producing tumours

In rare cases, other tumours in the body can produce ACTH. Approximately 17 per cent of Cushing's syndrome develops this way. Fifty per cent of cases result from lung tumours. Other causes come from tumours in the thymus, pancreas and thyroid gland. This type of Cushing's syndrome is sometimes referred to as 'ectopic'.

Multiple endocrine neoplasia 1 (MEN1)

The pituitary, pancreas, adrenals, thyroid and parathyroid glands belong to the endocrine system. MEN1 is an inherited condition characterised by tumours on at least two of these glands. If the pituitary or adrenals are affected, Cushing's syndrome can result.

Primary pigmented micronodular adrenal disease occurs in children and young adults, where there is an increase in the number of cortisol-producing adrenal tumours.

Glucocorticoid hormone therapy

Glucocorticoid drugs are commonly used to ease the symptoms of inflammatory conditions such as asthma, rheumatoid arthritis and lupus erythematosus. These drugs can trigger symptoms of Cushing's syndrome, although the effects should reverse once the drug therapy is stopped. However, suppression of a person's own adrenal function may persist, creating adrenal insufficiency, which may require replacement therapy during gradual withdrawal of glucocorticoid drugs.

Diagnosis of Cushing's syndrome

Diagnosis of Cushing's syndrome involves discovering high cortisol levels and uncovering the cause. Diagnosis may involve:

- Physical and visual examination, with full family medical history
- Blood tests to check if Cushing's is of pituitary or ectopic origin, and to compare ACTH levels elsewhere in the body. A combination of these two tests gives great accuracy for diagnosis
- Urine tests
- Dexamethasone suppression test using steroids to check the body's reaction to glucocorticoid drugs
- Magnetic resonance imaging (MRI) scans and computed tomography (CT) scans to check for gland size and evidence of tumours.

Treatment for Cushing's syndrome

Treatment depends on the cause and may include:

- **Tumour of the pituitary gland** – the tumour is surgically removed. Other options include radiation therapy and drug therapy to shrink the tumour and stop it from producing hormones. Various hormone replacements may be required after pituitary surgery.
- **Tumour of the adrenal gland** – the tumour is surgically removed. Replacement hormone therapy may be necessary for a short while.
- **ACTH-producing tumours** – treatment includes surgery to remove the tumour, followed possibly by chemotherapy, immunotherapy and radiation therapy. Medication can reduce the ability of the adrenal glands to make cortisol.
- **MEN1** – radiation therapy and surgery are used to remove the tumours and associated glands. Ongoing hormone replacement therapy is needed after surgery.
- **Glucocorticoid hormone therapy – induced iatrogenic Cushing's syndrome** – symptoms will gradually resolve if treatment can be reduced or stopped, which depends on the activity of the disorder. Treatment should never be stopped suddenly because of the possibility of adrenal suppression.

Where to get help

- Your doctor
- Endocrinologist
- The Australian Addison's Disease Association Inc. Tel. (02) 6652 4761; (02) 6657 2571.
- Australian Pituitary Foundation Tel. 1300 331 807
- The Western Australian Cushing's Disease Association Tel. (08) 9402 4394; (08) 9390 2132.

Things to remember

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This page has been produced in consultation with and approved by:

Australian Addison's Disease Association

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