

## Androgen deficiency in men

Androgen deficiency in men means the body has lower than normal amounts of male hormones – most importantly, testosterone. This deficiency may be caused by problems in the areas of the brain that control the function of the testes (pituitary gland and hypothalamus) or by problems in the testes themselves. Treatment involves testosterone replacement therapy.

Androgen deficiency in older men is sometimes called 'male menopause', but this is misleading.

### Male hormones

Hormones can be thought of as chemical messengers. They communicate with tissues in the body to bring about many different changes. Androgens are the group of sex hormones that give men their 'male' characteristics. They are crucial to sexual and reproductive function. They are also responsible for the development of secondary sexual characteristics in men including beard and body hair growth and bone and muscle development.

The major sex hormone in men is testosterone, which is produced mainly in the testes. The pituitary gland is a small gland located in the brain that controls the testes. This gland regulates the testes via two hormones – luteinising hormone and follicle stimulating hormone – which are also known as the gonadotrophins. The pituitary gland is under the control of a nearby area of the brain called the hypothalamus.

### Lower levels of hormones result in deficiency

Androgen deficiency means the body is exposed to lower than normal amounts of androgens, particularly testosterone. The effects depend on how severe the deficiency is, its cause and the age at which the deficiency begins.

When related to ageing, androgen deficiency is sometimes called 'male menopause'. This is a misleading term because it suggests that, like women, all men experience a dramatic drop in hormone production. This is not correct.

### Functions of testosterone

The major androgenic hormone is testosterone. Some of the functions of testosterone in the male body include:

- Starting and completing the process of puberty
- Bone and muscle development
- Growth of body hair, including beard
- Change of vocal cords to produce the male voice
- Sexual drive (libido) and sexual function
- Prostate gland growth and function
- Sperm production.

### Symptoms of androgen deficiency

When there is not enough testosterone circulating in the body, it can cause a wide range of symptoms. However, a number of these symptoms may be non-specific and can mimic the symptoms of other diseases and conditions.

Some of the symptoms of androgen deficiency include:

- Reduced sexual desire
- Hot flushes and sweating
- Breast development (gynaecomastia)
- Lethargy and fatigue
- Depression
- Reduced muscle mass and strength
- Increased body fat, particularly around the abdomen
- Weaker erections and orgasms
- Reduced amount of ejaculate
- Loss of body hair
- Increase in 'bad' blood cholesterol (low density lipoproteins) and associated drop in 'good' blood cholesterol (high density lipoproteins)
- Reduced bone mass, increased risk of osteoporosis.

## Androgen deficiency in the older male

Testosterone levels gradually decline after the age of 40. Some estimates suggest that up to one in five men over 70 years have low testosterone levels. A number of factors may contribute to the fall in testosterone, in addition to the ageing process itself. For example, any cause of poor general health, including obesity, will lower testosterone.

The importance of the fall in testosterone levels in older men is still not completely understood. There has been much media coverage using non-scientific terms like 'andropause' or 'male menopause', suggesting that many older men benefit from testosterone treatment. However, careful diagnosis of androgen deficiency is essential. Often there are other causes of ill health that should be treated.

Testosterone treatment should not be used until a full health assessment has been performed and testosterone levels are clearly shown to be low. Many studies are currently examining the effect of lower testosterone levels with increasing age and the effects of replacing testosterone in these men, including possible risks such as prostate cancer.

## Causes of androgen deficiency

Some of the causes of androgen deficiency include:

- **Testes** – medical problems that begin in the testes can prevent sufficient testosterone production. Some of these conditions are present from birth: for example, Klinefelter's syndrome – a genetic disorder that affects the sex chromosomes. Other conditions may occur at various stages of a boy's or a man's life: for example, undescended testicles, loss of testes due to trauma or 'twisting off' of the blood supply (torsion), complications following mumps and the side effects of chemotherapy or radiotherapy.
- **Pituitary gland** – the most common condition that affects the pituitary gland and leads to low testosterone levels is the presence of a benign tumour. The tumour may interfere with the function of the gland or it may produce a hormone that stops the production of the gonadotrophins and prevents the pituitary gland from signalling the testicles to produce testosterone.
- **Hypothalamus** – particular conditions, such as tumours or congenital abnormalities, can prevent the hypothalamus from prompting the pituitary gland to release hormones. This will inhibit testosterone production by the testicles. This is a rare cause of androgen deficiency.

## Diagnosis

Androgen deficiency is diagnosed using a number of assessments, including:

- **Medical history** – a full history is taken including details about fertility, sexual function, symptoms of androgen deficiency, other medical problems, occupation and drug use (prescribed and non-prescribed).
- **Physical examination** – a thorough general examination is performed, including measuring the size of the testicles and checking for breast development (gynaecomastia).
- **Blood tests** – are taken to determine the level of testosterone in the blood. Ideally, a blood test should be taken in the morning in order to detect the body's peak release of testosterone. Testosterone should be measured on two separate mornings. The pituitary hormones should also be measured.

- **Other tests** – may be required to determine if testosterone deficiency is due to another underlying medical condition. This may include blood tests to check for iron levels, genetic tests (to diagnose, for example, Klinefelter’s syndrome), or CT scans of the brain (to examine the pituitary gland). Semen analysis will help to determine the potential fertility of men with androgen deficiency.

## Treatment

Treatment for proven androgen deficiency is based on hormone (testosterone) replacement therapy. Testosterone can be administered by tablet, skin patch, gel or cream, injection (short or long acting) or implant. If the cause of testosterone deficiency is located in the pituitary gland, it may be appropriate to directly replace the luteinising hormone (LH) and follicle stimulating hormone (FSH) via injections. This is done for men whose partners wish to become pregnant.

Men who receive testosterone replacement therapy will have regular reviews with their doctor. Prostate examinations are performed according to a man’s age and other risk factors for prostate cancer.

## Possible side effects

The side effects of testosterone replacement therapy are not common, once levels are restored to the normal range. Some of the possible side effects include:

- Weight gain
- Mild acne
- Mood changes and increased aggression
- Male pattern baldness
- Breast development
- Older men may experience problems with urine flow.

Boys who have not completed puberty should only be treated by paediatric hormone specialists.

## Prostate disease and testosterone therapy

Both normal and cancerous cells in the prostate gland rely on male hormones like testosterone for growth. If a man already has prostate enlargement, this will need to be monitored carefully if testosterone is prescribed.

At present, there is no evidence to suggest that appropriate testosterone replacement therapy increases a man’s risk of developing prostate disease, including prostate cancer. However, men with a history of prostate cancer will not usually be considered for testosterone therapy.

## Where to get help

- Your doctor
- Andrology Australia Tel. 1300 303 878

## Things to remember

- Androgens are the hormones that give men their ‘male’ characteristics.
- Androgen deficiency means the body is exposed to lower than normal amounts of testosterone.
- Causes of androgen deficiency include problems and conditions of the testicles, pituitary gland and hypothalamus.
- Androgen deficiency and its treatment in older men require more research.
- Androgen deficiency is treated with testosterone replacement therapy.

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Andrology Australia

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