

Obesity and hormones

The endocrine system is made up of glands that secrete hormones into the bloodstream. Hormones are chemical messengers that regulate body processes. The endocrine system works with the nervous system and the immune system to help the body cope with different events and stresses. Excesses or deficits of hormones can lead to obesity. For example, a deficiency of growth hormone may predispose to fat deposition.

Leptin, the fat hormone

The hormone leptin is produced by fat cells and is secreted into the bloodstream. Leptin reduces appetite by acting on specific centres of the brain to reduce the urge to eat. It also seems to control how the body manages its store of body fat. Since leptin is produced by fat, leptin levels tend to be higher in obese people than in people of normal weight. The issue being researched at the moment is why obese people are obese, considering they have higher than usual levels of an appetite-reducing hormone. One theory is that obese people aren't as sensitive to the effects of leptin. Research is focusing on why leptin messages aren't getting through to the brain in obese individuals.

Leptin and dieting

Various studies have shown that blood leptin levels drop after low kilojoule diets. Reduced leptin levels may increase appetite and slow metabolism. This may help to explain why crash dieters usually regain their lost weight. It is possible that leptin therapy may one day help dieters to maintain their weight loss in the long term, but more research is required before this becomes a reality.

The female hormone oestrogen

Body fat distribution plays an important role in the development of obesity-related conditions such as heart disease, stroke and some forms of arthritis. Abdominal fat is a higher risk factor for disease than fat stored on the bottom, hips and thighs. It seems that oestrogen helps to decide body fat distribution. Oestrogen is one of the female sex hormones made by the ovaries. It is responsible for prompting ovulation every menstrual cycle. Women of childbearing age tend to store fat in the lower body ('pear shaped'), while men and postmenopausal women store fat around the abdomen ('apple shaped'). Postmenopausal women on oestrogen supplements don't accumulate fat around the abdomen. Animal studies have also shown that a lack of oestrogen leads to excessive weight gain.

Growth hormone

The pituitary gland in the brain produces growth hormone, which influences an individual's height and contributes to bone and muscle building. Growth hormone also affects metabolism (the rate at which kilojoules are burned for energy). Researchers have found that growth hormone levels in obese people are lower than those in people of normal weight.

Behaviour influences these hormones

Obese people have hormone levels that encourage the accumulation of body fat. It seems that behaviours such as overeating and lack of regular exercise, over time, 'reset' the processes that regulate appetite and body fat distribution to make the person physiologically more inclined to gain weight. The body is always trying to maintain balance, so it resists any short term disruptions such as crash dieting. However, there is evidence to suggest that long term behaviour changes, such as healthy eating and regular exercise, can retrain the body to shed excess body fat and keep it off.

Where to get help

- Your doctor
- An accredited practising dietitian, contact the Dietitians Association of Australia

Things to remember

- The hormones leptin, oestrogen and growth hormone influence appetite, metabolism and body fat distribution.
- Obese people have hormone levels that encourage the accumulation of body fat.

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