OBesity

A disease of excess body fat that can have a negative effect on health, leading to reduced life expectancy and other health problems.

Related Diagnoses:
Varicocele | Azoospermia | Erectile dysfunction | Polycystic ovary syndrome | Anovulation | Menstrual cycle disorders | Anejaculation |
Ejaculatory disorders | Turner syndrome | Adenomyosis | Oligozoospermia | Hypogonadism | Endometrial cancer |
Endometrial hyperplasia | Uterine fibroids | Hypoestrogenism | Hypoandrogenism | Heart disease | Hyperinsulinaemia

About Obesity

In Western countries, people are considered obese when their body mass index (BMI) exceeds 30 kg/m2, with the range 25-30 kg/m2 defined as overweight. BMI is closely related to both percentage body fat and total body fat.

Obesity increases the likelihood of various diseases, such as heart disease, diabetes and cancer, sleep apnea, along with other illnesses such as joint problems or high blood pressure. There are several factors contributing towards obesity and interaction between these factors is very complex. Obesity is most commonly caused by a combination of excessive food energy intake, lack of physical activity, and genetic susceptibility, although a few cases are caused primarily by genes, endocrine disorders, medications, or psychiatric illness. Evidence to support the view that some obese people eat little yet gain weight due to a slow metabolism is limited. On average, obese people have a greater energy expenditure than their thin counterparts due to the energy required to maintain an increased body mass. Moreover, social, economic, environmental factors and behavioural factors are also contributing to obesity. For instance, sedentary lifestyle plays a significant role in obesity.

Associated Diseases

Heart disease, type 2 diabetes, high blood cholesterol, sleep apnea, certain types of cancer, asthma, stroke, migraines, and osteoarthritis. It can also lead to polycystic ovarian syndrome, menstrual disorders, infertility or erectile dysfunction. Binge eating disorder can increase obesity risk. In general, it can reduce life expectancy, lead to social stigmatisation and it is considered to be a leading preventable causes of death.

Complications

Obesity can cause several complications including breathlessness, difficulty doing any activity, increased level of exhaustion or low self-esteem.

Risk factors

- genetics
- family lifestyle
- unhealthy diet
- medications
- physical inactivity
- stress
- age
Impact on fertility

Obesity leads to infertility in both men and women. This is primarily due to excess estrogen interfering with normal ovulation in women and altering spermatogenesis in men. It is believed to cause 6% of primary infertility. The most frequent anovulatory cycles are related to polycystic ovary syndrome (PCOS) occurrence, commonly associated with obesity and hormonal disturbances in the course of obesity. Obese women also have increased risk of preterm births and low birth weight infants. On top of that, women who are obese during pregnancy have a greater risk of having child malformations.

Obesity was also found to be associated with male infertility related to erectile dysfunction, hormonal disturbances and a reduction in sperm count and quality. The risk factors of male infertility include age, some chronic diseases, especially obesity and its related disorders as well as infectious diseases, use of some medications, environmental factors (lead, arsenic, aniline dyes, ionizing radiation, electromagnetic fields, exposure), and lifestyle factors (high-fat and high-caloric diet, low physical activity, smoking, drinking and drug use, as well as tight and plastic clothing).

It is well known that obesity is associated with erectile dysfunction. The risk factors of erectile dysfunction include obesity grade, visceral obesity, low testosterone level, and physical inactivity.

Obesity-related hormonal disturbances are not restricted to androgen deficiency. It was suggested that decreased sex hormone-binding globulin (SHBG) and increased free testosterone levels in consequence favor testosterone to estradiol conversion in adipose tissue. Decreased testosterone-to-estradiol ratio contributes to impaired spermatogenesis and infertility development.

Both obesity and infertility are the important risk factors of psychological disturbances and poor quality of life among women and men in reproductive age. On the other hand, the mood disorders may exacerbate the hormonal disturbances and worsen the effectiveness of infertility management.

Multiple reproductive dysfunctions have been associated with obesity including anovulation, and infertility. Obese patients undergoing IVF or intracytoplasmic sperm injection (ICSI) treatment are known to have increased FSH requirement, fewer collected oocytes, and frequent cycle cancellation, lower pregnancy rate and increase miscarriage rate than their non-obese counterpart.

Prevention

Traditionally, obesity prevention is aimed at behavioural changes and lifestyle modification at a personal level and it is still the case today, leading to widespread stigma directed at obese individuals even by health professionals. Much time, money, and effort is risked into believing that obesity is a matter of personal responsibility while crucial opportunities to make key environmental changes and have a greater impact on obesity prevention are missed. The situation is further exacerbated by different concepts of obesity prevention made available to the obese person through public health authorities, the food and marketing industry, and, lastly, the government. Obese individuals are unable to make healthy choices when they are wrongly influenced towards unhealthy ones. Concerns have also been raised over the use of BMI as an obesity indicator. Much bias may arise due to BMI variations arising as a result of ethnicity, age, sex, and differences in body build.

Symptoms

People are considered obese when their BMI is 30 or higher.

- Any BMI \( \geq 35 \) or\( 40 \) kg/m\(^2\) is severe obesity.
- A BMI of \( \geq 35 \) kg/m\(^2\) and experiencing obesity-related health conditions or \( \geq 40 - 44.9 \) kg/m\(^2\) is morbid obesity.
- A BMI of \( \geq 45 \) or\( 50 \) kg/m\(^2\) is super obesity

Other symptoms are:

- Obstructive sleep apnea
- Obesity hypoventilation syndrome
Therapies

Self therapy

The main treatment for obesity consists of diet modification, lifestyle changes and doing physical exercise. Diet programs may produce weight loss over the short term, but maintaining this weight loss is frequently difficult and often requires making exercise and a lower calorie diet a permanent part of an individual’s lifestyle. Dietary and lifestyle changes are effective in limiting excessive weight gain in pregnancy and improve outcomes for both the mother and the child.

With use, muscles consume energy derived from both fat and glycogen. Due to the large size of leg muscles, walking, running, and cycling are the most effective means of exercise to reduce body fat.

Conventional medicine

Psychotherapy

Also stress frequently triggers overeating which can lead to obesity. Psychological causes of stress eating and other types of emotional eating include poor awareness of internal physiological states and inability to differentiate between the hunger cues and emotional arousal. Some individuals are more susceptible to stress-induced eating than others and may adopt a self-regulation strategy for coping with aversive states in which attention is shifted away from negative self-appraisal or affect and towards the immediate stimulus environment, such as food. Mindfulness-based intervention may be effective in reducing stress and improving stress-related overeating. Mindfulness training reduces psychological stress and enhances psychological well-being for a variety of health conditions, may improve cortisol patterns, may reduce binge eating and other eating disorder symptoms among patients with eating disorders, and may reduce weight among obese and non-obese adults. Besides that yoga, meditation and other mind-body therapies could help in treatment of obesity; nevertheless, more research need to be done on these form of therapies in treatment of obesity.

Pharmacotherapy

Three medications; orlistat (Xenical), lorcaserin (Belviq) and a combination of phentermine and topiramate (Qsymia) are currently available and have evidence for long term use. Weight loss with orlistat is modest, an average of 2.9 kg (6.4 lb) at 1 to 4 years. Its use is associated with high rates of gastrointestinal side effects and concerns have been raised about negative effects on the kidneys. The other two medications are available in the United States but not Europe. Lorcaserin results in an average 3.1 kg weight loss (3% of body weight) greater than placebo over a year; however, it may increase heart valve problems. A combination of phentermine and topiramate is also somewhat effective; however, it may be associated with heart problems. There is no information on how these drugs affect longer-term complications of obesity such as cardiovascular disease or death.

Surgical Therapy

Bariatric surgery

Bariatric surgery ("weight loss surgery") is the use of surgical intervention in the treatment of obesity. As every operation may have complications, surgery is only recommended for severely obese people (BMI > 40) who have failed to lose weight following dietary modification and pharmacological treatment. Weight loss surgery relies on various principles: the two most common approaches are reducing the volume of the stomach (e.g. by adjustable gastric banding and vertical banded gastroplasty), which produces an earlier sense of satiation, and reducing the length of bowel that comes into contact with food (gastric bypass surgery), which directly reduces absorption. Band surgery is reversible, while bowel shortening operations are not. Some procedures can be performed laparoscopically. Complications from weight loss surgery are frequent.
Assisted reproduction

For patients who do not respond to diet, lifestyle modification, therapies, surgery and/or medication, in vitro fertilisation with ICSI can be performed. This usually includes controlled ovarian hyperstimulation with FSH injections, and oocyte release triggering with human chorionic gonadotropin (hCG) or a GnRH agonist. IVF-ICSI and other related ART fertilization techniques (IVF-PICSI, MACS etc.) must be used in the case of alteration of sperm values in obese men. Severe cases of obesity are associated with unfavorable IVF/ICSI cycle outcome as evidenced by lower pregnancy rates.

Find more about related issues

**Diagnoses**

**Varicocele**
An abnormal enlargement of the pampiniform venous plexus in the scrotum.
Learn more at: [www.fertilitypedia.org/therapy/diag/varicocele](http://www.fertilitypedia.org/therapy/diag/varicocele)

**Azoospermia**
Complete absence of sperm in the ejaculate of a man.
Learn more at: [www.fertilitypedia.org/therapy/diag/azoospermia](http://www.fertilitypedia.org/therapy/diag/azoospermia)

**Erectile dysfunction**
The inability (that lasts more than 6 months) to develop or maintain an erection of the penis during sexual activity.
Learn more at: [www.fertilitypedia.org/therapy/diag/erectile-dysfunction](http://www.fertilitypedia.org/therapy/diag/erectile-dysfunction)

**Polycystic ovary syndrome**
A condition in which a woman has an imbalance of female sex hormones. This may lead to changes in the menstrual cycle, cysts in the ovaries, trouble g.
Learn more at: [www.fertilitypedia.org/therapy/diag/polycystic-ovary-syndrome](http://www.fertilitypedia.org/therapy/diag/polycystic-ovary-syndrome)

**Anovulation**
Failure of the ovaries to release an oocyte over a period of time generally exceeding 3 months.
Learn more at: [www.fertilitypedia.org/therapy/diag/anovulation](http://www.fertilitypedia.org/therapy/diag/anovulation)

**Menstrual cycle disorders**
An abnormal condition in a woman’s menstrual cycle.
Learn more at: [www.fertilitypedia.org/therapy/diag/menstrual-cycle-disorders](http://www.fertilitypedia.org/therapy/diag/menstrual-cycle-disorders)

**Anejaculation**
The pathological inability to ejaculate in males, with (orgasmic) or without (anorgasmic) orgasm.
Learn more at: [www.fertilitypedia.org/therapy/diag/anejaculation](http://www.fertilitypedia.org/therapy/diag/anejaculation)

**Ejaculatory disorders**
A class of sexual disorders defined as the subjective lack of normal ejaculation.
Learn more at: [www.fertilitypedia.org/therapy/diag/ejaculatory-disorders](http://www.fertilitypedia.org/therapy/diag/ejaculatory-disorders)

**Turner syndrome**
Turner syndrome is a genetic disorder in which a female is partly or completely missing one X chromosome that results in ovarian dysgenesis.
Learn more at: [www.fertilitypedia.org/therapy/diag/turner-syndrome](http://www.fertilitypedia.org/therapy/diag/turner-syndrome)
Adenomyosis
Medical condition characterized by the presence of ectopic endometrial tissue within the myometrium.
Learn more at: www.fertilitypedia.org/therapy/diag/adenomyosis

Oligoospermia
Semen with a low concentration of sperm and is a common finding in male infertility.
Learn more at: www.fertilitypedia.org/therapy/diag/oligoospermia

Hypogonadism
A medical term which describes a diminished functional activity of the gonads – the testes and ovaries.
Learn more at: www.fertilitypedia.org/therapy/diag/hypogonadism

Endometrial cancer
Cancer that arises from the endometrium, the lining of the uterus.
Learn more at: www.fertilitypedia.org/therapy/diag/endometrial-cancer

Endometrial hyperplasia
Thickening of the lining of the uterus.
Learn more at: www.fertilitypedia.org/therapy/diag/endometrial-hyperplasia

Uterine fibroids
The most common benign smooth muscle tumors of the uterus encountered in women of reproductive age.
Learn more at: www.fertilitypedia.org/therapy/diag/uterine-fibroids

Hypoestrogenism
A lower than normal level of estrogen which is the primary sex hormone in women.
Learn more at: www.fertilitypedia.org/therapy/diag/hypoestrogenism

Hypoandrogenism
A medical condition characterized by not enough androgenic activity in the body.
Learn more at: www.fertilitypedia.org/therapy/diag/hypoandrogenism

Heart disease
Various types of conditions that can affect the function of the heart or blood vessels, which may have the negative effect also to the infertility
Learn more at: www.fertilitypedia.org/therapy/diag/heart-disease

Hyperinsulinaemia
Excess levels of insulin circulating in the blood relative to the level of glucose and impairing the hormonal levels, even those involved in reproduct
Learn more at: www.fertilitypedia.org/therapy/diag/hyperinsulinaemia

Biological control

Estrogen
The primary female sex hormone responsible for the development and regulation of the female reproductive system and secondary sex characteristics.
Learn more at: www.fertilitypedia.org/edu/biological-control/estrogen

Insulin
A peptide hormone that decreases blood glucose levels.
Learn more at: www.fertilitypedia.org/edu/biological-control/insulin
Progesterone
Steroid hormone, secreted by the ovaries, whose function is to prepare the uterus for the implantation of a fertilized ovum and to maintain pregnancy.
Learn more at: www.fertilitypedia.org/edu/biological-control/progesterone

Testosterone
Steroid hormone produced primarily in the testes of the male; responsible for the development of secondary sex characteristics in the male.
Learn more at: www.fertilitypedia.org/edu/biological-control/testosterone

Reproductive functions

Fertilization
The fusion of an ovum with a sperm to initiate the development of a new individual organism.
Learn more at: www.fertilitypedia.org/edu/reproductive-functions/fertilization

Implantation
The very early stage of pregnancy at which the embryo adheres to the wall of the uterus.
Learn more at: www.fertilitypedia.org/edu/reproductive-functions/implantation

Oogenesis
The process of the maturation of the female gametes through the meiotic division.
Learn more at: www.fertilitypedia.org/edu/reproductive-functions/oogenesis

Ovulation
The release of egg(s) from the ovaries.
Learn more at: www.fertilitypedia.org/edu/reproductive-functions/ovulation

Spermatogenesis
Process in which spermatozoa are produced from male primordial germ cells in testicles by way of mitosis and meiosis.
Learn more at: www.fertilitypedia.org/edu/reproductive-functions/spermatogenesis

Risk factors

Asthma
A chronic inflammatory disease of the airways characterized by variable and recurring symptoms, reversible airflow obstruction and bronchospasm.
Learn more at: www.fertilitypedia.org/edu/therapy/RF/asthma

Binge eating disorder
A disorder of eating seen among people who go on eating binges and then feel guilt, depression and self-condemnation.
Learn more at: www.fertilitypedia.org/edu/therapy/RF/binge-eating-disorder

Diabetes mellitus
A condition in which the body either does not produce enough, or does not properly respond to insulin, a hormone produced in the pancreas.
Learn more at: www.fertilitypedia.org/edu/therapy/RF/diabetes-mellitus

Excessive food energy intake
The intake of more energy from food than body need for its function resulting in restoration of fat.
Learn more at: www.fertilitypedia.org/edu/therapy/RF/excessive-food-energy-intake

Hypercholesterolemia
The presence of high levels of cholesterol in the blood.
Learn more at: www.fertilitypedia.org/edu/therapy/RF/hypercholesterolemia
Hypertension
An elevated blood pressure, clinically defined as at or greater than 140/90 (systolic/diastolic) mmHg.
Learn more at: www.fertilypedia.org/therapy/rf/hypertension

Lack of physical activity
A type of lifestyle with little or no physical activity.
Learn more at: www.fertilypedia.org/therapy/rf/lack-of-physical-activity

Low level of estrogen
A diminished level of blood estrogen level.
Learn more at: www.fertilypedia.org/therapy/rf/low-level-of-estrogen

Low level of FSH
A condition with low serum follicle-stimulating hormone (FSH) concentration.
Learn more at: www.fertilypedia.org/therapy/rf/low-level-of-fsh

Low level of testosterone
An abnormally low testosterone production which may occur because of testicular or hypothalamic-pituitary dysfunction.
Learn more at: www.fertilypedia.org/therapy/rf/low-level-of-testosterone

Osteoarthritis
A type of joint disease that results from breakdown of joint cartilage and underlying bone.
Learn more at: www.fertilypedia.org/therapy/rf/osteoarthritis

Sedentary lifestyle
Type of lifestyle with no or irregular physical activity.
Learn more at: www.fertilypedia.org/therapy/rf/sedentary-lifestyle

Stroke
A sudden interruption in the blood supply of the brain.
Learn more at: www.fertilypedia.org/therapy/rf/stroke

 Symptoms

Avoidance of sex
A medical condition whose main symptom is low sexual desire.
Learn more at: www.fertilypedia.org/edu/symptoms/avoidance-of-sex

Lowered libido
The absence of sexual appetite.
Learn more at: www.fertilypedia.org/edu/symptoms/lowered-libido

Migraines
A severe headache felt as a throbbing pain at the front or side of the head.
Learn more at: www.fertilypedia.org/edu/symptoms/migraines

Obesity hypoventilation syndrome
A condition in which obese people fail to breathe rapidly or deeply enough, resulting in low blood oxygen levels and high blood CO2 (carbon dioxide).
Learn more at: www.fertilypedia.org/edu/symptoms/obesity-hypoventilation-syndrome

Overweight
Body weight that's greater than what is considered healthy for a certain height.
Learn more at: www.fertilypedia.org/edu/symptoms/overweight
Sleep apnea
Pauses in breathing or periods of shallow breathing during sleep.
Learn more at: www.fertilitypedia.edu/symptoms/sleep-apnea

Therapies

Bariatric surgery
A variety of surgical procedures to reduce weight performed on people who have obesity.
Learn more at: www.fertilitypedia.edu/therapies/bariatric-surgery

Egg donation
Process by which a woman donates eggs for purposes of assisted reproduction or biomedical research.
Learn more at: www.fertilitypedia.edu/therapies/egg-donation

ICSI
A micromanipulative fertilization technique in which a single sperm is injected directly into an egg.
Learn more at: www.fertilitypedia.edu/therapies/icsi

Lifestyle change
The way a person lives.
Learn more at: www.fertilitypedia.edu/therapies/lifestyle-change

Medical nutrition therapy
It is a therapeutic approach to treating medical conditions and their associated symptoms via the use of a specifically tailored diet.
Learn more at: www.fertilitypedia.edu/therapies/medical-nutrition-therapy

Pharmacotherapy of obesity
Pharmacological agents that reduce or control weight.
Learn more at: www.fertilitypedia.edu/therapies/pharmacotherapy-of-obesity

Physical exercise
Physical exercise is any bodily activity that enhances or maintains physical fitness and overall health and wellness.
Learn more at: www.fertilitypedia.edu/therapies/physical-exercise-1

Psychotherapy of obesity
The use of psychological methods to help to treat the obesity.
Learn more at: www.fertilitypedia.edu/therapies/psychotherapy-of-obesity

Sperm donation
The procedure in which a man (sperm donor) provides his sperm for fertility treatment.
Learn more at: www.fertilitypedia.edu/therapies/sperm-donation

Standard IVF
A process in which an egg is fertilised by sperm outside the body: in vitro. Own or donated gametes may be used.
Learn more at: www.fertilitypedia.edu/therapies/standard-ivf

Gallery
Medical complications of obesity

Obesity can lead to severe medical complications which can have a negative impact on the overall quality of life.

Sources

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