

Reproductive Physiology - Abnormalities and Disorders

Abnormal Spermatogenesis and Male Fertility:

Abnormalities in the reproductive system can impact male fertility. Several factors can contribute to abnormal spermatogenesis, including genetic abnormalities, hormonal imbalances, infections, exposure to toxins or radiation, and certain medications. Conditions such as bilateral orchitis (caused by mumps) or cryptorchidism (undescended testis, can be treated surgically) can lead to sterility. Additionally, excessive heat or radiation (even though Leydig cells can continue to produce Testosterone) can destroy the germinal epithelium of the testes, affecting sperm production. When the number of the sperms is less than 20 million, the person is likely to be infertile. Even with a normal sperm count, abnormalities in sperm morphology or motility can still result in infertility.

Abnormalities of Male Sexual Function:

- The Prostate Gland and Its Abnormalities: The prostate gland grows during puberty due to testosterone, maintains a relatively stable size between 20-50 years, and starts to involute after the age of 50. Abnormal overgrowth of prostate tissue, known as benign prostatic hypertrophy (BPH), commonly occurs in older men and can lead to urinary obstruction. Prostate cancer is responsible for a small percentage of male deaths.
- Hypogonadism in the Male: reduced testosterone production. If the testes are nonfunctional during fetal life, the male sexual characteristics do not develop, and female organs form instead. If a boy loses his testes before puberty: state of eunuchism, he may exhibit infantile sexual characteristics throughout life, the height of an adult eunuch is slightly **greater** than that of a normal man, underdeveloped sex organs, weak muscles, childlike voice, and a lack of masculine hair distribution.
- Hypogonadism after Puberty: When a man is castrated after puberty, the sexual organs regress in size but not to a childlike state. However, there may be voice regression, loss of masculine hair production, decreased musculature, and reduced sexual desires. While erections can still occur, ejaculation is rare due to the degeneration of semen-forming organs and loss of testosterone-driven psychic desire.
- Testicular Tumors and Hypergonadism: Interstitial Leydig cell tumors can cause rapid growth of muscles and bones, early fusion of epiphyses (**Short man**), and exaggerated male sexual characteristics. Tumors of the germinal epithelium, known as teratomas, contain various tissues and may secrete hormones such as hCG and estrogen.
- Erectile Dysfunction in the Male: or impotence, refers to the inability to develop or maintain an erection for satisfactory sexual intercourse. It can be caused by neurological problems such as trauma to the parasympathetic nerves from prostate surgery, low testosterone levels, certain drugs, vascular diseases (such as hypertension, diabetes, and atherosclerosis), and other factors. Treatment options for vascular-related erectile dysfunction include phosphodiesterase-5 (PDE-5) inhibitors like sildenafil (Viagra),

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ildenafil (Levitra), or tadalafil (Cialis), which enhance vasodilation and improve blood flow to the erectile tissue.

Abnormalities of Secretion by the Ovaries:

Disorders related to ovarian function can affect female reproductive health.

Hypogonadism refers to reduced secretion by the ovaries, which can occur when the ovaries are absent from birth, become nonfunctional before puberty. This can result in female eunuchism, where secondary sexual characteristics fail to develop, Prolonged growth of the long bones (**Tall Female**). When the ovaries of a fully developed woman are removed the sexual organs regress to some extent (The same changes occur in women after menopause).

Female Sterility:

Female sterility can be caused by abnormal physiological function of the genital system or abnormal genetic development of the ova. The most common cause of female sterility is failure to ovulate, which can result from hyposecretion of gonadotropic hormones or abnormal ovaries that do not allow ovulation. Anovulatory cycles, characterized by insufficient preovulatory surge of luteinizing hormone (LH), can occur at puberty or before menopause. Various methods, including hormonal analysis and charting body temperature (**Progesterone** raises the body Temp. about 0.5F), can be used to detect ovulation and guide treatment (Timed administration of hcG).

Preeclampsia and Eclampsia:

Preeclampsia, also known as toxemia of pregnancy, is a condition characterized by pregnancy-induced hypertension and proteinuria in the last few months of pregnancy. It is associated with excess salt and water retention, weight gain, impaired vascular endothelium, and arterial spasm in organs such as the kidneys, brain, and liver.

The exact causes of preeclampsia are not fully understood, but several theories suggest excessive secretion of placental or adrenal hormones, autoimmunity or allergy in the mother triggered by the fetus, and insufficient blood supply to the placenta. In women with preeclampsia, the maternal spiral arteries fail to undergo normal adaptive changes, leading to inadequate blood supply to the placenta. This triggers the release of substances from the placenta that impair vascular endothelial function, decrease blood flow to the kidneys, cause salt and water retention, and increase blood pressure.

During normal placental development, trophoblasts invade and remodel the maternal arteries, creating larger blood vessels with low resistance. However, in preeclampsia, this adaptive process fails to occur, resulting in insufficient blood supply to the placenta and subsequent release of substances that affect maternal vascular function.

Eclampsia is an extreme form of preeclampsia, characterized by seizures, coma, and organ dysfunction. Immediate termination of pregnancy and medical management are necessary to reduce mortality.

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