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**MATRIC NUMBER:18/MHS02/190**

**DEPARTMENT: NURSING**

**COURSE CODE: PHS 212.**

**Assignment**

Write short notes on the following:

Spermatogenesis

Testosterone

Semen

Male infertility

Male Orgasm

**1 spermatogenesis:** Is one of the three major reproductive functions of the male, it is generally known as the formation of sperm. It is the process by which haploid spermatozoa develop from germ cells in the seminiferous tubules of the testis. This process starts with the mitotic division of the sperm cells located close to the basement membrane of the tubules. These cells are called spermatogonial stem cells. There are three stages of spermatogenesis:

1. Spermatocytogenesis(mitosis)
2. Meiosis
3. Spermaiogenesis

**\***Spermatocytogenesis ( also called mitosis ):stem cells ( Type A spermatogonial, singular= spermatogonium ) divide mitotically to replace themselves and to produce cells that begin differentiation. (Type B spermatogonia) spermatogonia have spherical or oval nuclei and rest on the basement membrane.

\*Meiosis: Cells in prophase of the first meiotic division are primary spermatocytes. They are characterized by highly condensed chromosomes giving the nucleus a coarse chromation pattern and an intermediate position in the seminiferous epitheium. This is a long stage, so many primary spermatocytes go through the first meiotic division and become **secondary spermatocytes.** The cells quickly proceed through this stage and complete the second meiotic division. Because this stage is short there are few secondary spermatocytes to be seen insections. Meiosis is the process by which the diploid number of chromosomes present in spermatogonia ( the stem cells ) is reduced to the haploid number present in mature spermatozoa. The products of the second meiotic division are called **spermatids.** They are spherical cells with interphase nuclei, positioned high in the epitheium since spermatids go through a metamorphosis into spermatozoa, they occur in early through late stages. All of these progeny cells remain attached to each other by cytoplasmic bridges. The bridges remain until sperm are truly differentiated.

\*Spermiogenesis: This is the metamorphosis of spherical **spermatids** into enlongated **spermatozoa**. No further mitosis or meiosis occurs. During spermiogenesis, the acrosome forms, the flagellar apparatus forms and most excess cytoplasm ( the residual body ) is separated and left in the sertoli cell. Spermatozoa are released into the lumen of the seminiferous tubule. A small amount of excess cytoplasm ( the cytoplasmic droplet ) is she’d later in the epididymis.

**2 Testosterone:** Testosterone is the primary sex hormone and anabolic steroid. In male humans testosterone plays a key role in the development of male reproductive tissues such as testes and prostate as well as promoting secondary sexual characteristics such as increased muscle and bone Mass and the growth of body hair. The regulation of testosterone production is tightly controlled to maintain normal levels in blood, although levels are usually highest in the morning and full after that. The hypothalamus and pituitary gland are important in controlling the amount of testosterone produced by the testes. In response to **gonadotropin-realeasing hormone** from the hypothalamus the pituitary gland produces luteinizing hormone which travels in the blood stream to the gonads and stimulates the production and release of testosterone. As blood levels of testosterone increase, this feeds back to suppress the production of gonadotropin-realeasing hormone from the hypothalamus which in turn suppress production of luteinizing hormone by the pituitary gland. Levels of testosterone begin to fall as a result so **negative** **feedbacks** decreases and the hypothalamus resumes secretion of gonadotropin-realeasing hormone.

**3 Semen:** Semen, also known as seminal fluid, is an organic fluid that contains spermatozoa. It is secreted by the gonads (sexual glands) and other sexual organs of male or hermaphroditic animals and can fertilize the female ovum. In humans, seminal fluid contains several components besides spermatozoa: proteolytic and other enzymes as well as fructose are elements of seminal fluid which promote the survival of spermatozoa, and provide a medium through which they can move or “swim”. Semen is produced and originates from the seminal vesicle, which is located in the pelvis. The process that results in the discharge of semen is called ejaculation. Semen is also a form of genetic material. In animals, semen has been collected for cryoconservation.

**4 Male infertility:** Male infertility refers to a man’s inability to cause pregnancy in a fertile female. In humans, it accounts for 40-50% of infertility. It affects approximately 7% of all men. Male infertility is commonly due to deficiencies in the semen and semen quality is used as a surrogate measure of male fecundity.

Some of the factors causing male infertility are:

* Immune infertility
* Genetics
* Klinefelter's syndrome
* Y chromosomes deletions and others such as:
* Age
* Abnormal set of chromosomes
* Mumps
* Neoplasm etc.

Prevention of male infertility includes:

* Avoid smoking as it damages sperm DNA
* Avoid heavy marijuana and alcohol use
* Avoid excessive heat to the testes
* Maintain a healthy diet
* Wear a protective cup and jockstrap to protect testicles.

**5 Male Orgasm:** The male orgasm is a complex system involving multiple hormones, organs and nerve pathways.

The hormone testosterone, produced in the testicles, plays a central role by enhancing the sexual desire(libido) that leads to arousal, erection, and ultimately orgasm. By contrast, low testosterone not only decreases a man’s energy and mood, it makes him less responsive to sexual stimuli both physical and mental.

With that being said, a man often only requires physical stimulation to achieve arousal, while women typically need physical and mental stimulation to achieve the same.

The male ejaculate, semen, is comprised of sperm cells and seminal fluid, the latter of which contains phosphorylcholine(an enzyme that aids in fertility) and fructose (which provides fuel for sperm). The average volume of semen expelled by a healthy man is around a teaspoon.

**Four Phases of the male orgasm.**

The route to ejaculation in men is actually delineated by four distinct phases, of which orgasm is third

**Stage one: Arousal**

Arousal is the stage in which physical, sensory and emotional prompt the brain to release a neurotransmitter known as acetyleholme. This, in turn triggers the release of nitric oxide into the arteries of the penis, causing them to expand and rapidly fill with blood.

**Stage two: Plateau**

Plateau is the phase immediately preceding orgasm in which the voluntary thrusts of the body, specifically the pelvis, suddenly become involuntary, increasing in both intensity and speed. It is at this stage that the heart rate increases to between 150 and 175 beats per minute, accompanied by a marked rise in blood pressure and body temperature.

Traces of seminal fluid ('pre-cum') may leak from the urethra.The release of pre-ejaculatory fluid is more than just incidental; it alters the pH of the urethra so that the sperm has a better chance of survival.

All fold, the Plateau phase lasts between 30 seconds and 2minutes.

**Stage three: Orgasm**

The orgasm phase is divided into 2 parts. The **first** **stage**, known as **emission** is the stage where ejaculation is inevitable. This is immediately followed by the **second stage,** known as **ejaculation**, in which strong contractions of the penile muscle, anus, and perineal muscles help propel the semen from the body.

During orgasm, the reward center of the brain(specifically the cerebellum, amygdala, nucleus accumbens, and ventral fegmental area) is flooded with neurochemicals inciting the intense emotional response associated with an orgasm.

At the same time, the **lateral orbitofrontal cortex** located behind the left eye shuts down entirely. This is the part of the brain that plays a central role in judgement and self-control. The effect explains why people often describe an orgasm as a state where “nothing else matters”.

**Stage four: Resolution and Refraction:**

Resolution is the phase following orgasm where the penis starts to lose its erection. This is often accompanied by feelings of extreme relaxation or even drowsiness.

Refraction, also known as the refractory period is the stage following climax when a man is unable to achieve another erection even with stimulation. In younger men, the refractory period may be as short as 15 minutes. In older men, it may last as long as an entire day.