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Question
Write short notes on the following:
1 Spermatogenesis
2 Testosterone
3 Semen
4 Male orgasm
5 Male infertility

Answer
1. **Spermatogenesis** 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 stem cells located close to the basement membrane of the tubules.[1] These cells are called spermatogonial stem cells. The mitotic division of these produces two types of cells. Type A cells replenish the stem cells, and type B cells differentiate into primary spermatocytes. The primary spermatocyte divides meiotically (Meiosis I) into two secondary spermatocytes; each secondary spermatocyte divides into two equal haploid spermatids by Meiosis II. These develop into mature spermatozoa, also known as sperm cells.[2] Thus, the primary spermatocyte gives rise to two cells, the secondary spermatocytes, and the two secondary spermatocytes by their subdivision produce four spermatozoa and four haploid cells.[3]
Spermatogenesis is highly dependent upon optimal conditions for the process to occur correctly, and is essential for sexual reproduction. DNA methylation and histone modification have been implicated in the regulation of this process.[4] It starts at puberty and usually continues uninterrupted until death, although a slight decrease can be discerned in the quantity of produced sperm with increase in age (see Male infertility).
Spermatogenesis starts in the bottom part of seminiferous tubes and, progressively, cells go deeper into tubes and moving along it until mature spermatozoa reaches the lumen, where mature spermatozoa are deposited.

2. **Testosterone** is the hormone responsible for the development of male sexual characteristics. Hormones are chemical messengers that trigger necessary changes in the body. Females also produce testosterone, usually in smaller amounts.
It is a type of androgen produced primarily by the testicles in cells called the Leydig cells.
Without adequate amounts of testosterone, men become infertile. This is because testosterone assists the development of mature sperm.

Despite being a male sex hormone, testosterone also contributes to sex drive, bone density, and muscle strength in women. However, an excess of testosterone can also cause women to experience male pattern baldness and infertility.
The brain and pituitary gland control testosterone levels. Once produced, the hormone moves through the blood to carry out its various important functions.

3. **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. Cryoconservation of animal genetic resources is a practice that calls for the collection of genetic material in efforts for conservation of a particular breed.

4. **Orgasm** and ejaculation are two separate physiological processes that are sometimes difficult to distinguish. Orgasm is an intense transient peak sensation of intense pleasure creating an altered state of consciousness associated with reported physical changes. Antegrade ejaculation is a complex physiological process that is composed of two phases (emission and expulsion), and is influenced by intricate neurological and hormonal pathways. Despite the many published research projects dealing with the physiology of orgasm and ejaculation, much about this topic is still unknown. Ejaculatory dysfunction is a common disorder, and currently has no definitive cure. Understanding the complex physiology of orgasm and ejaculation allows the development of therapeutic targets for ejaculatory dysfunction. In this article, we summarize the current literature on the physiology of orgasm and ejaculation, starting with a brief description of the anatomy of sex organs and the physiology of erection. Then, we describe the physiology of orgasm and ejaculation detailing the neuronal, neurochemical, and hormonal control of the ejaculation process.

5. **Male fertility** refers to a **male's** ability to cause pregnancy in a fertile female. In humans it accounts for 40–50% of **fertility**. It affects approximately 93% of all **men**. **Male fertility** is not due to deficiencies in the semen, and semen quality is used as a surrogate measure of **male** fecundity.Sperm health depends on various factors, including quantity, movement and structure:

- **Quantity.** You're most likely to be fertile if your ejaculate — the semen discharged in a single ejaculation — contains at least 15 million sperm per milliliter. Too little sperm in an ejaculation might make it more difficult to get pregnant because there are fewer candidates available to fertilize the egg.

- **Movement.** To reach and fertilize an egg, sperm must move — wriggling and swimming through a woman's cervix, uterus and fallopian tubes. This is known as motility. You're most likely to be fertile if at least 40 percent of your sperm are moving.
- **Structure (morphology).** Normal sperm have oval heads and long tails, which work together to propel them. While not as important a factor as sperm quantity or movement, the more sperm you have with a normal shape and structure, the more likely you are to be fertile.