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Write short notes on the following :

1. Spermatogenesis
2. Testosterone
3. Semen
4. Male orgasm
5. Male infertility

1. **Spermatogenesis:** 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.] 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. The spermatids are transformed into spermatozoa (sperm) by the process of spermiogenesis. These develop into mature spermatozoa, also known as sperm cells. 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.
2. **Testosterone:** Testosterone is the primary male 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. In addition, testosterone is involved in health and well-being, and the prevention of osteoporosis. Insufficient levels of testosterone in men may lead to abnormalities including frailty and bone loss.
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. 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. **Male orgasm:** Ejaculation is the discharge of semen (normally containing sperm) from the male reproductive tract as a result of an orgasm. It is the final stage and natural objective of male sexual stimulation, and an essential component of natural conception. In rare cases, ejaculation occurs because of prostatic disease. Ejaculation may also occur spontaneously during sleep (a nocturnal emission or "wet dream"). Anejaculation is the condition of being unable to ejaculate. Ejaculation is usually very pleasurable for men; dysejaculation is an ejaculation that is painful or uncomfortable. Retrograde ejaculation is the condition where semen travels backwards into the bladder rather than out the urethra.
5. **Male infertility:** Male infertility refers to a male'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.

Factors relating to male infertility include:

- Immune infertility

Antisperm antibodies (ASA) have been considered as infertility cause in around 10–30% of infertile couples. ASA production are directed against surface antigens on sperm, which can interfere with sperm motility and transport through the female reproductive tract, inhibiting capacitation and acrosome reaction, impaired fertilization, influence on the implantation process, and impaired growth and development of the embryo. Risk factors for the formation of antisperm antibodies in men include the breakdown of the blood-testis barrier, trauma and surgery, orchitis, varicocele, infections, prostatitis, testicular cancer, failure of immunosuppression and unprotected receptive anal or oral sex with men.

- Genetics

Chromosomal anomalies and genetic mutations account you for nearly 10–15% of all male infertility cases

Other

- Age
- Abnormal set of chromosomes
- Centriole
- Neoplasm, e.g. seminoma
- Idiopathic failure
- Cryptorchidism
- Trauma
- Hydrocele
- Hypopituitarism in adults, and hypopituitarism untreated in children (resulting in growth hormone deficiency and proportionate dwarfism.)
- Mumps
- Malaria
- Testicular cancer
- Defects in USP26 in some cases
- Acrosomal defects affecting egg penetration
- Idiopathic oligospermia - unexplained sperm deficiencies account for 30% of male infertility.