

**NAME: Atule Iye Favour**

**DEPARTMENT: Nursing Science**

**LEVEL: 200 Level**

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## **1.**

### **SPERMATOGENESIS:**

This is defined as the process by which haploid spermatozoa develop from germ cells in the seminiferous tubule of the testis. The 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 produce two types of cells;

- Type A cells, which replenish the stem cells
- Type B cells, which differentiate into primary spermatocytes.

The primary spermatocytes give rise to two cells; The secondary spermatocytes, and the two secondary spermatocytes by their subdivision gives rise to four spermatozoa and four haploid cells. Spermatozoa are the mature male gametes in many sexually reproducing organisms. Thus, spermatogenesis is the male version of gametogenesis, of which the female equivalent is Oogenesis.

Spermatogenesis produces mature male gametes, commonly known as *sperm* but more specifically known as *spermatozoa*, which are able to fertilize the counterpart female oocyte during conception to produce the zygote. Spermatogenesis takes place within several structures of the male reproductive system. The initial stages occur within the testes and progress to the epididymis where the developing gametes mature and are stored until ejaculation.

The seminiferous tubules of the testis are the starting point for the process. Maturation occurs in the epididymis. The location [testes/scrotum] is specifically important as the process of spermatogenesis requires a lower temperature to produce the viable sperm, 1°C - 8°C lower than

normal body temperature. For humans, the entire process is estimated to 74 days and approximately 120 days.

## 5.

### **MALE INFERTILITY:**

Male infertility refers to a male's inability to cause pregnancy in a fertile female. In human 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. Risk factors for the formation of Antisperm antibodies in men include; the breakdown of the blood-testis barrier, trauma and surgery, infections, prostatitis, etc.

- Genetics- chromosomal anomalies and genetic mutations account for nearly 10-15% of all male infertility cases.
- Klinefelter Syndrome- It is a chromosomal defect that occurs during gamete formation due to a non-disjunction error during cell division. It is one of the most commonly known causes of male infertility.
- Y chromosomes deletions- It is a direct cause of infertility due to its effects on sperm production, occurring in 1 out of 2000 males. Men with this condition can exhibit azoospermia (no sperm production) or oligozoospermia (small number of sperm production).

Pre-testicular causes- Pre-testicular factors refer to conditions that impede adequate support of the testes and include situations of poor hormonal support and poor general health including:

- Varicocele- It is a condition of swollen testicle veins. It is present in up to 35% of cases of primary infertility and 69 – 81% of secondary infertility.
- Tobacco smoking- There is increasing evidence that the harmful products of tobacco smoking may damage the testicles and kill the sperm, but their effect on male fertility is still unclear.

Post-testicular causes- Post-testicular factors decrease male fertility due to conditions that affect the male genital system after testicular sperm production and include defects of the genital tract as well as problems in ejaculation:

- Vas deferens obstruction
- Ejaculatory duct obstruction
- Hypospadias

**Prevention:**

- Avoid smoking as it damages sperm DNA.
- Avoiding heavy marijuana and alcohol use.
- Avoiding excessive heat to the testis.