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500L MLS

MLS 514 QUIZ.

## ① THE ANTERIOR PITUITARY GLAND.

The anterior pituitary gland is one of the major organs of the endocrine system. The anterior, ~~and~~ posterior and glandular lobes that make up the pituitary gland.

The anterior pituitary gland secretes the following hormones

1. Growth hormone
2. Prolactin
3. Luteinizing hormone
4. Follicle stimulating hormone
5. Thyroid-stimulating hormone
6. Adrenocorticotrophic hormone.

1. Growth hormone: is a hormone secreted by the anterior pituitary gland that promotes growth. It stimulates cells to grow and divide (mitosis & meiosis), increases bone and muscle growth, it increases ~~bone~~ protein synthesis. Growth hormone is vital for normal physical growth in children.

2. Prolactin: This hormone stimulates milk production after child birth. In breast feeding mothers, suckling infants causes afferent nerve impulses to travel from lactating breast to the hypothalamus, the hypothalamus signals the anterior pituitary to allow the release of prolactin.

3. Follicle stimulating hormone: This is a tropic hormone that stimulates the growth of follicles in the ovaries and sperm development in the testes.

In females, the follicles grow and mature, the egg is ready for ovulation. This hormone stimulates production of egg and sperm. It regulates the development, growth and pubertal maturation and reproductive processes of the body.

4 Luteinizing hormone: also a tropic hormone. In women this hormone rise leads to ovulation and development of corpus luteum. In males, it stimulates the Leydig cells to produce testosterone. Luteinizing hormone works alongside the follicle-stimulating hormone.

5 Thyroid stimulating hormone: This hormone stimulates the thyroid gland to produce thyroxine ( $T_4$ ) and triiodothyronine ( $T_3$ ) which stimulates the metabolism of almost every tissue in the body. Thyroid-stimulating hormone is a glycoprotein hormone produced by the thyrotrope cells in the anterior pituitary which regulates the endocrine function of the thyroid.

6 Adenocorticotrophic hormone (ACTH): This hormone is an important component of the hypothalamic-pituitary-adrenal axis. It is often produced in response to biological stress. Its principal effects are increased production and release of cortisol by the cortex of the adrenal gland.

b) Letrozole : This is an aromatase inhibitor which is used in the treatment of hormonally responsive breast cancer and infertility in women.

Principle: Letrozole interferes with estrogen receptor.

In infertility cases, it is prescribed to induce ovulation. It functions to prevent/stop androgens in the body from converting to estrogen. When estrogen is blocked, the pituitary gland gets the signal and needs to produce follicle-stimulating hormone which stimulates the ovary to produce egg.

Clomiphene : This is a drug used to treat infertility in women

Principle: This drug works by stimulating an increase in the amount of hormones that support growth and release of viable egg (ovulation)

Menotropin : A hormonally active medication for treatment of fertility disturbances. This medication is a mixture of FSH and LH

Principle: This medication helps the body produce multiple eggs during ovulation especially in preparation for in vitro fertilization.

②

Amenorrhoea is the absence of menstruation. The most common cause of amenorrhoea in ladies below 45 that are <sup>of</sup> menstrual age is pregnancy. Other causes include:

problems with reproductive organs or the glands that regulate hormone levels.

Natural amenorrhoea can be caused by: pregnancy, breast-feeding or menopause.

Abnormal amenorrhoea: this could be due to side effect of medication

-ion or a sign of medical problem. Drugs like contraceptives can stop period for some months or make it fluctuate.

Laboratory findings possible in Amenorrhoea.

1. Pregnancy - A pregnancy test will be the first test ordered by the doctor to rule out or confirm pregnancy.
2. Thyroid function : A test can be done to measure the amount of thyroid stimulating hormone and Thyroid hormones  $T_3$  and  $T_4$  in the blood to determine the functionality of the thyroid. This test is done when the lady is tested negative for pregnancy.
3. Ovary function : The follicle stimulating hormone is measured to determine the amount in the blood and analyze the ovary function.
4. Prolactin test : Low levels of prolactin may be a sign of pituitary gland tumor.

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In a lady of 60 years lack of menstruation is common because menopause would have kicked in.

Menopause is the cessation of menstruation for 12 consecutive months. Menopause begins at about 40-50 years of life in women. Menopause is a natural biological process.

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Investigation of infertility in couples.

Investigation in female.

An initial evaluation of a woman's fertility includes a personal and family history along with a thorough physical examination,

The laboratory investigation include:

Hormonal tests.

1. Serum progesterone: Progesterone is a steroid hormone whose main role is to help prepare a woman's body for pregnancy.
2. Thyroid function test: This is done for women with irregular menstrual cycle and for women with signs or symptoms of hyperprolactinemia.
3. Prolactin: This hormone is normally elevated in women during pregnancy and just after childbirth. Its primary role is milk production. Prolactin is absent in non pregnant women.
4. Luteinizing hormone: Produced by the pituitary gland is responsible for the release of egg in women ovaries. In case of pituitary failure, the LH will not be produced.
5. Follicle stimulating hormone: This hormone is associated with reproduction and the development of eggs in women. Disorders affecting the hypothalamus, pituitary and ovaries can cause FSH to be produced in little or no amounts.

## Investigation of male

This includes; general physical examination, medical history.

1. Semen analysis: Semen sample is collected into a sterile container and analysis is done within an hour of collection. The sperm motility, number of sperm cells, forward progression, tail presence, etc are analysed. Semen consistency, color, pH, etc are also evaluated.

2. Hormonal assay :

- Follicle-stimulating hormone & luteinizing hormones :

A problem with the hypothalamus and pituitary gland will affect the function of the FSH and LH in turn affecting the male ability to produce viable sperm cells.

- Free and total testosterone : Testosterone is mainly produced by special endocrine tissue called Leydig cells in the testicles. These Leydig cells are controlled by the luteinizing hormone. Measurement of total testosterone will help in diagnosis of male infertility.

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How to support a couple in achieving conception :

1. In vitro fertilization : This technique is applied when the fertilization cannot occur in vivo either due to immobility of sperm cells or the uterus pH.

Sperm is placed with unfertilized egg in a petri dish where fertilization takes place.

2 Assisted reproductive technology : This encompasses any fertility treatment for assisting reproduction including :

handling of human eggs, sperm or embryos. It involves surgically removing the eggs from the ovaries of <sup>the</sup> woman and combining it with sperm in the lab. and placing the embryo back in the woman's body

3 Surrogacy : is an arrangement supported by a legal ~~aggre~~ agreement, where by a woman become the carrier of a child on behalf of another person.

4 Intracytoplasmic sperm injection : This is the injection of a single mature sperm (immobilized normal spermatozoa) into the cytoplasm of a mature metaphase II oocyte.