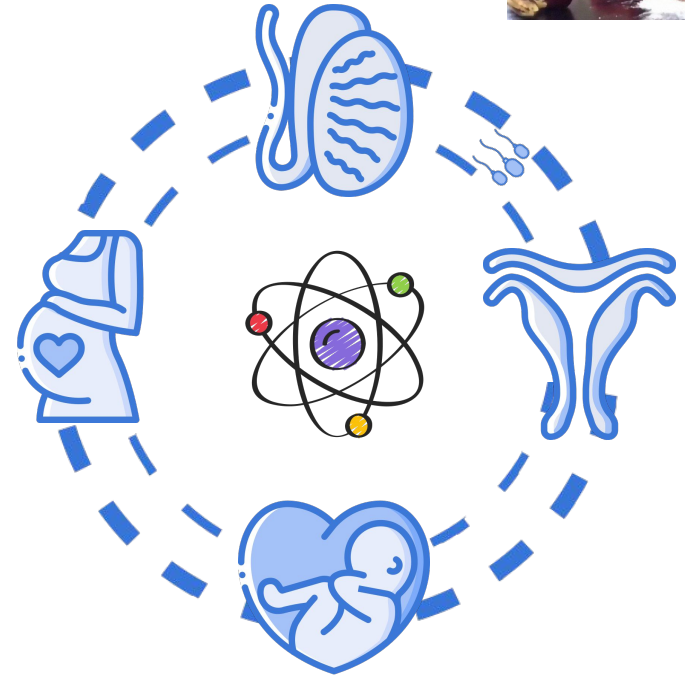


Investigation of Infertile Couple



Color Index:

- Main Topic
- Main content
- Important
- Drs' notes
- Extra info



Objectives:

- ✓ Identify the causes of infertility in men and women.
- ✓ Understand the diagnostic approaches to infertility in men and women.
- ✓ Interpret the results of investigation of infertility in men and women.



Overview:

- ☆ Infertility / subfertility & Clinical history and physical examination,
- ☆ Endocrine investigations in subfertile women & men.
- ☆ Endocrine causes of female infertility & Diagnostic approaches to subfertility in women and men.
- ☆ Hyperprolactinemia.

Me after washing my hands for 20 seconds 57 times in one day



Infertility / Subfertility ¹

Definition

Failure of a couple to conceive after **one year** of regular, unprotected intercourse.

Causes

- **Endocrine problem:** It's common in females (1/3rd patients) & **rare in males.**
- **Idiopathic:** In some couples no cause can be identified.



Clinical History ²

Information on clinical history of the patient should include:

1	Previous pregnancies ³ .	5	Congenital abnormalities.
2	Use of contraceptives ⁴ .	6	Drug usage.
3	Serious illness.	7	STDs.
4	Past chemo /radiotherapy ⁵ .	8	Frequency of intercourse.



Physical Examination

Information on physical examination of the patient should include:

1	Hypothalamo-pituitary, thyroid disorders.
2	Cushing's syndrome ⁶ .
3	Galactorrhea (Lactation in the absence of pregnancy, most common due to hyperprolactinemia).
4	Hirsutism ⁷ .

1. Infertility is an absolute inability to conceive, but most of the cases are relative/ due to secondary causes, so we call it subfertility.

2. First you should check the age, menstrual cycle and BMI then you check the other things, if the age is < 35 yrs old you should give them a year to try again, if >40 yrs old investigate immediately.

3. To check if it primary infertility or secondary. If there wasn't any previous pregnancy = primary infertility.

4. Decrease fertility for a while after you stop taking them.

5. Damage the oocytes.

6. High BMI and central obesity can lead to insulin resistance which affect androgen and therefore gonads.

7. Points to PCOS or androgen excess.

Endocrine Investigations In Subfertile Women

1

Investigations are based on the phase of menstrual cycle.

2

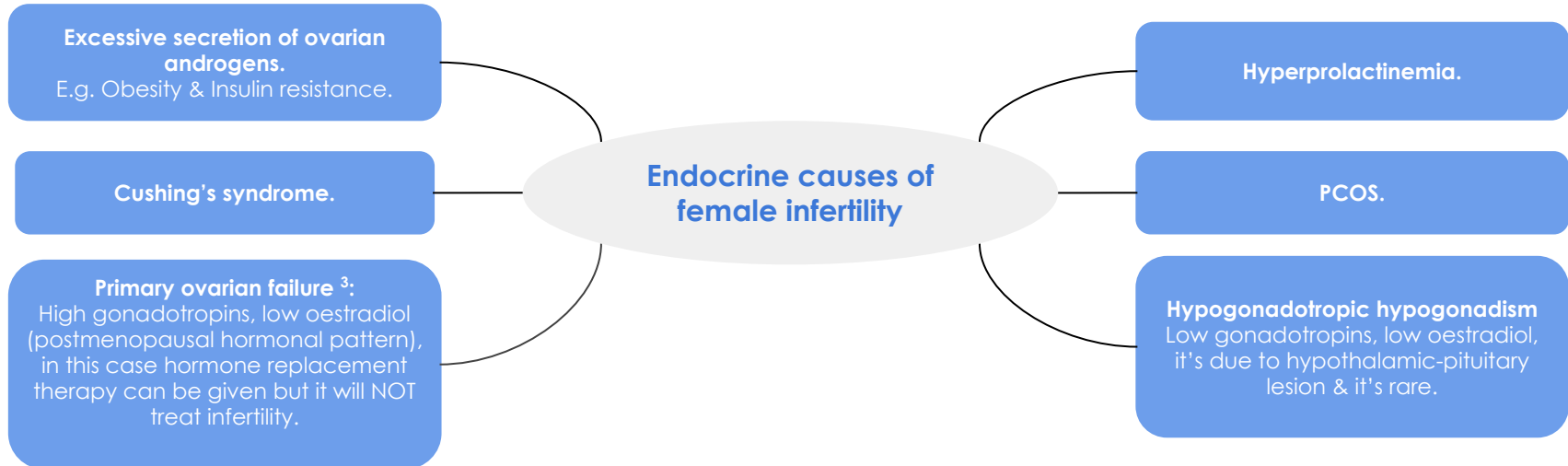
Serum progesterone ¹ should be measured in the **middle of the luteal phase (day 21)**.

3

High progesterone (>30 nmol/L) indicates ovulation ².

4

In oligomenorrhea or amenorrhea, hormone measurement is needed.



1. Normally there'll be increase in progesterone hormone secretion during the luteal phase, progesterone stimulates the growth or thickening of the lining of the uterus which prepares the uterus for implantation of a fertilized egg. If the body doesn't secrete enough progesterone the uterine lining will not develop properly, which makes it impossible for a fertilized egg to implant in the uterus.

2. Progesterone levels peak a week after ovulation, measuring progesterone levels at this peak time gives us a way to assess ovulation.

3. In primary ovarian failure (or hypergonadotropic hypogonadism) the problem is in the ovaries, it doesn't produce estrogen and progesterone (low) so there's no negative feedback to the pituitary and hypothalamus to stop the release of gonadotropin which lead to high FSH and LH. While in hypogonadotropic hypogonadism FSH and LH will be low also estrogen and progesterone are low and that could be due to a problem in the hypothalamus or the pituitary.

Anti-Mullerian Hormone (AMH)

What is it?

A polypeptide hormone called Mullerian-inhibiting substance, it's secreted by the growing (immature) ovarian follicles and the secretion is proportional to follicular development.

Function

It prevents the premature depletion of follicles ¹. Thus, its measurement helps in assessing the ovarian reserve and female fertility.

Ovarian reserve: number and quality of oocytes in the ovaries.

01

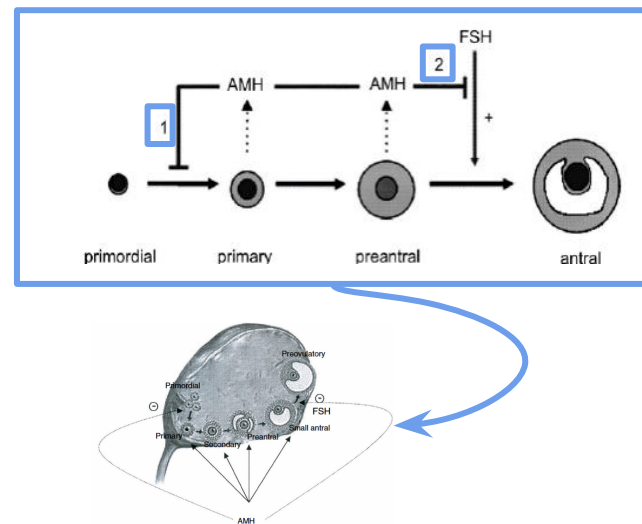
AMH in the ovary will **inhibit** the initial recruitment of primary follicles from primordial follicles.

02

AMH In the ovary will **inhibit** the sensitivity of antral follicles to FSH during cyclical recruitment.



The number of remaining primordial follicles correlate with the number of growing follicles. Since only growing follicles produce AMH, its plasma levels reflect the number of remaining primordial follicles.










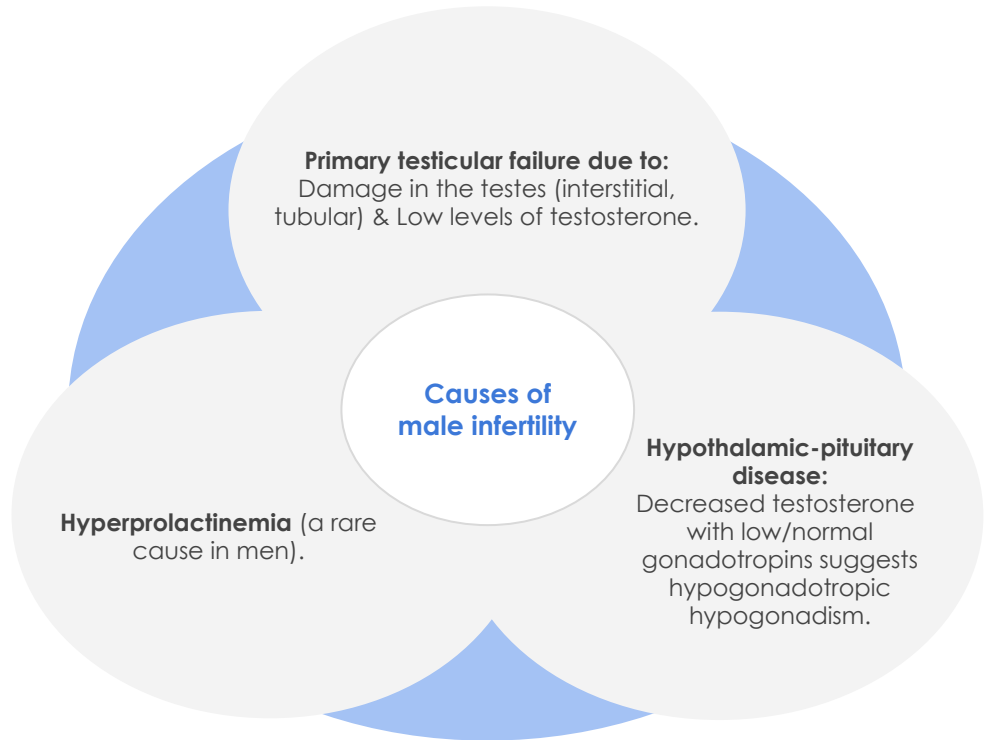
1. Females are not capable of making new eggs, in fact there is a continuous decline in the total number of eggs each month, when there are fewer developing eggs in the ovaries, the chance of a mature and healthy egg being released and fertilised decreases. AMH inhibits the recruitment & maturation of follicles which helps in preventing the premature depletion of follicles. This gives us an idea how AMH levels helps us in assessing the ovarian reserve/capacity. If AMH was high → high reserve → better fertility.
In males, AMH suppress the development of paramesonephric duct (mullerian duct) to female internal organs.

Endocrine Investigations in Subfertile Men

Eugonadal men with normal sperm analysis do not require endocrine investigations, while in hypogonadal men the testosterone hormone and gonadotropins should be measured.

Semen analysis

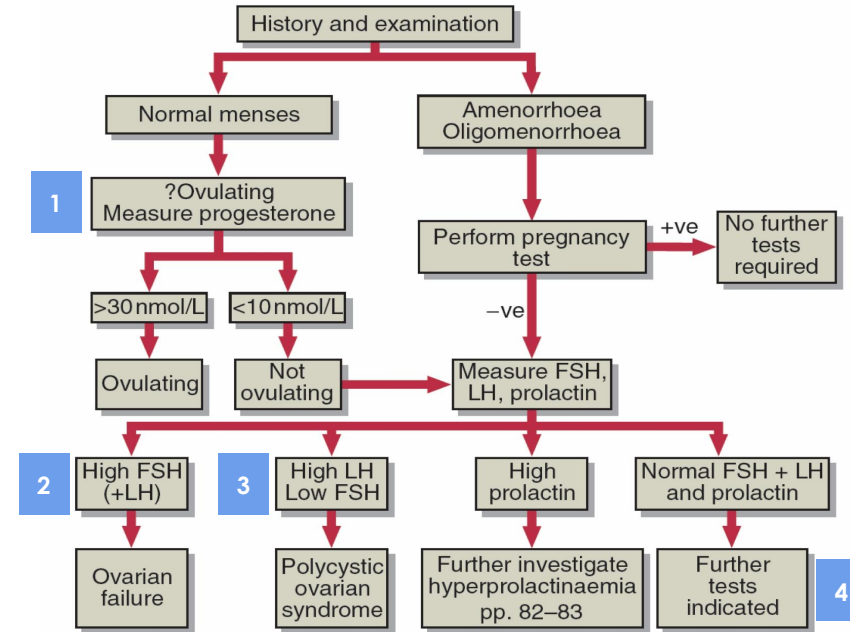
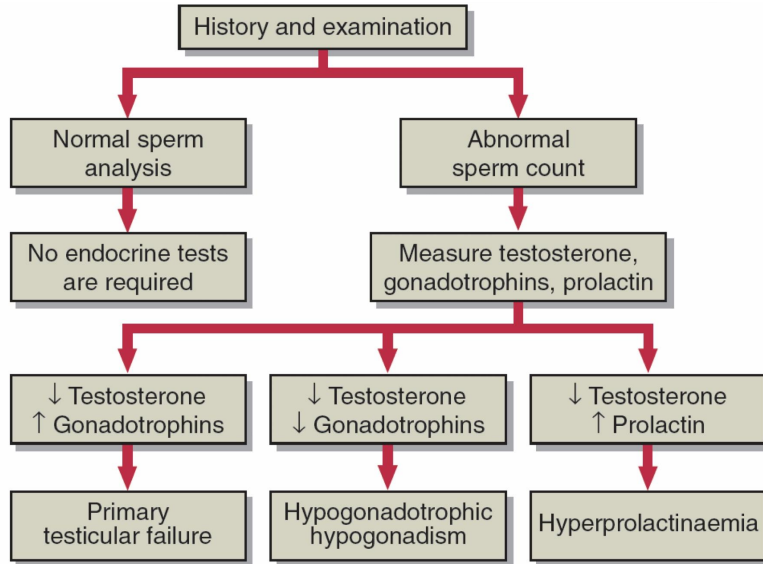
-  Volume.
-  Liquefaction time.
-  Sperm count.
-  Motility.
-  Presence of abnormal spermatozoa.
-  pH (should be 7.2-7.8, acidity damage the sperm)
-  WBCs.



Diagnostic Approach To Subfertility

Male

Female



1. A serum progesterone of 30 nmol/L or greater when measured 7 days before the next predicted menstruation (e.g. day 21 of a 28 day cycle) is good evidence of ovulation. Lower progesterone levels do not exclude the possibility of an ovulatory cycle so we should also check the other hormones.

2. An increase in FSH and LH in women may indicate a reduction in the production of good quality eggs and embryos for fertilization.

3. LH causes the egg to be released from the ovary, a process called ovulation. Higher than normal levels of LH in a woman may mean that the ovaries are not functioning, it's a classical picture of PCOS.

4. Look for other causes of infertility like structural anomalies it could be problem with anything else like the fallopian tube or the uterus itself.

Hyperprolactinemia

Hormone Affected	Prolactin: it's an anterior pituitary hormone.
Regulation	Its secretion is tightly regulated by: TRH (Stimulation) , Dopamine (Inhibition) both from hypothalamus.
Target	It acts directly on the mammary glands to control lactation.
Abnormal Secretion	Elevation → Causes infertility in both sexes due to gonadal function impairment.
Early Indication	-In women: amenorrhea & galactorrhea. -In men: none.



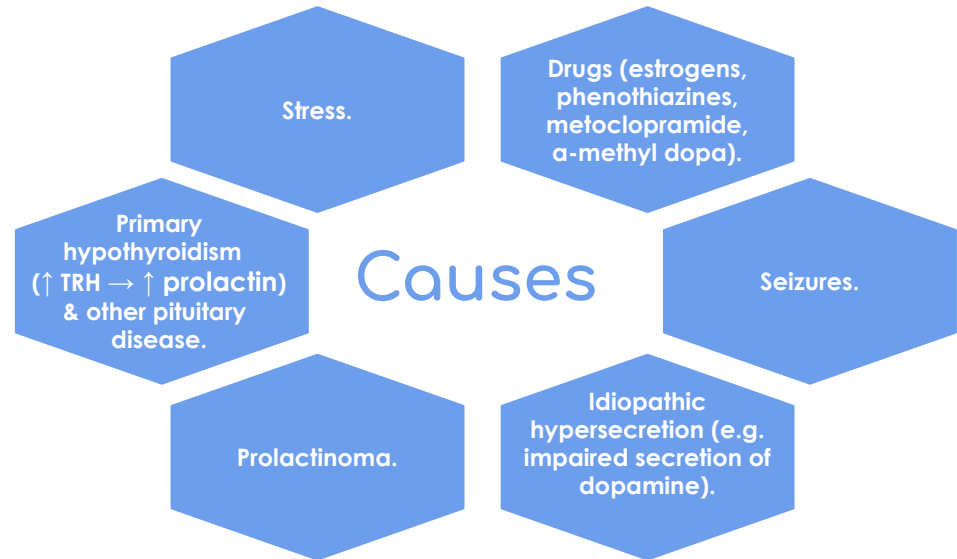
Diagnosis

Exclude the following:

- Stress.
- Drugs.
- Other diseases.

Differential diagnosis:

- Prolactinoma.
- Idiopathic hypersecretion.





Take Home Messages

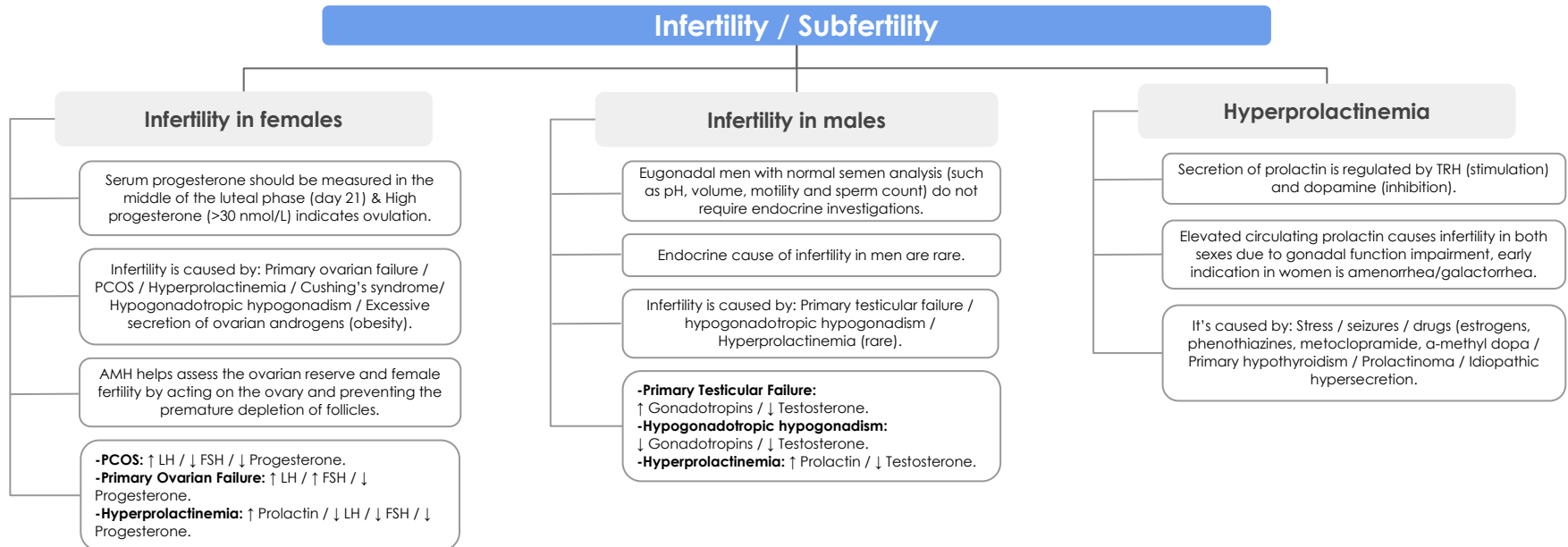


Endocrine causes of infertility are more common in women than men & Hyperprolactinemia is a rare cause of male infertility.



In women serum progesterone >30 nmol/L indicates ovulation.

Summary



Quiz

MCQs :

Q1: In polycystic ovarian syndrome, which hormone is elevated?

- a) Dopamin b) Progesterone c) FSH d) LH

Q2: Which of the following drugs could cause hyperprolactinemia?

- a) Bromocriptine b) Cabergoline c) Metoclopramide d) Cycloset

Q3: Which of the following is TRUE in primary testicular failure?

- a) ↓ Testosterone ↑ prolactin b) ↓ Testosterone ↑ Gonadotropins
c) ↓ Testosterone ↓ Gonadotropins d) ↑ Testosterone ↑ Gonadotropins

Q4: Which of the following is FALSE about primary ovarian failure?

- a) Low gonadotropins b) It follows a postmenopausal hormonal pattern
c) Low oestradiol d) Infertility cannot be treated by HRT

Q5: Progesterone should be measured in which phase?

- a) Ovulation phase (Day 21) b) Ovulation phase (Day 28)
c) Luteal phase (Day 21) d) Luteal phase (Day 28)

Q6: Which of the following is TRUE about AMH?

- a) It stimulates the initial recruitment of primary follicles
b) Its plasma levels reflect the number of remaining primordial follicles
c) It inhibits the sensitivity of antral follicles to LH

SAQs :

Q1: List 3 information that should be included in the physical examination of infertility and 3 in the clinical history?

Q2: List 3 causes of infertility in females and 3 in males?

Q3: List 4 causes of hyperprolactinemia?

Q4: List 2 actions of AMH on the ovary?

★ MCQs Answer key:


1) D 2) C 3) B 4) A 5) C 6) B

★ SAQs Answer key:

- 1) Physical Examination: Cushing's syndrome - Hirsutism - Galactorrhea, Clinical History: Previous pregnancy - Use of drugs - Chemotherapy
- 2) Females: Primary ovarian failure - PCOS - Hyperprolactinemia
Males: Primary testicular failure - Hypogonadotropic hypogonadism - Hyperprolactinemia
- 3) Prolactinoma - Stress - Drugs such estrogens - Primary hypothyroidism
- 4) In the ovary it will inhibits both the initial recruitment of primary follicles from primordial follicles and the sensitivity of antral follicles to FSH during cyclical recruitment.

Team members



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- ★ It sounds simple telling people to work hard and never quit, but to really execute and demonstrate those principles takes discipline and faith. Those are the two factors that separate the good from the great, the successes from the failures.



We hear you