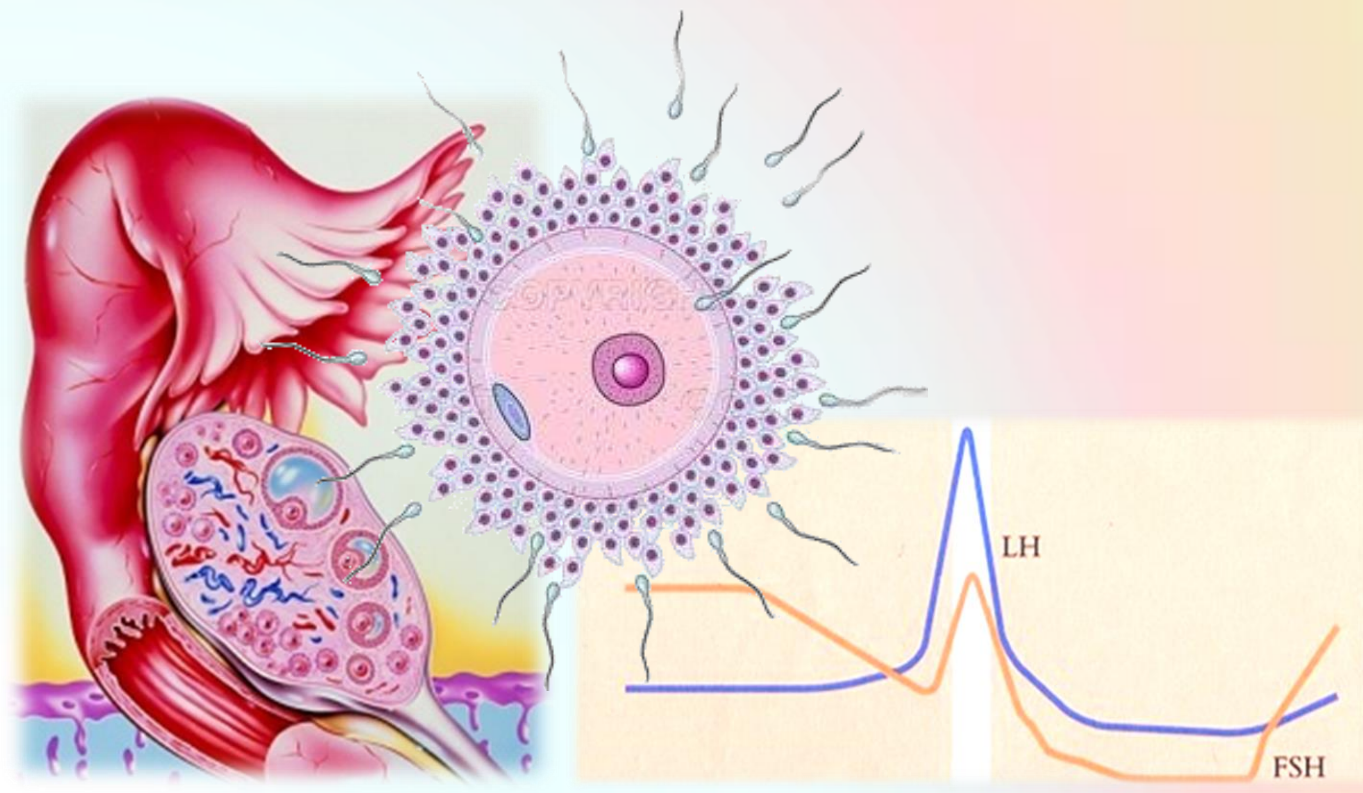


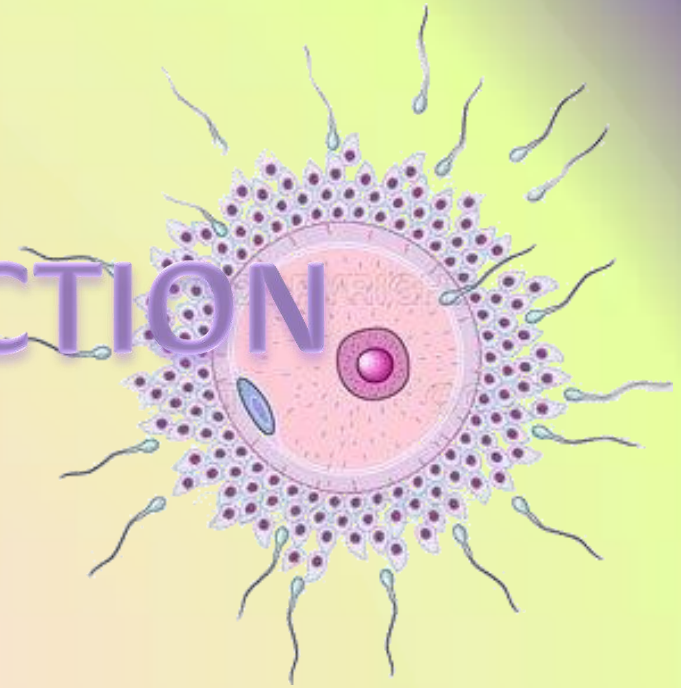
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Dept. of Pharmacology

Drugs In OVULATION INDUCTION



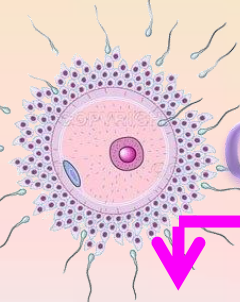
Drugs In OVULATION INDUCTION



ILOs

By the end of this lecture you will be able to:

- ① Recall how ovulation occurs and specify its hormonal regulation
- ① Classify ovulation inducing drugs in relevance to the existing deficits
- ① Expand on the pharmacology of each group with respect to mechanism of action, protocol of administration, indication, efficacy rate and adverse effects.



Ovulation Induction

1. Antiestrogens

SERMs;
Clomiphene
Tamoxifen

2. GnRH

GnRH-agonists
Leuprolin
Goserelin

4. Hyperprolactinaemia

D₂ R agonists

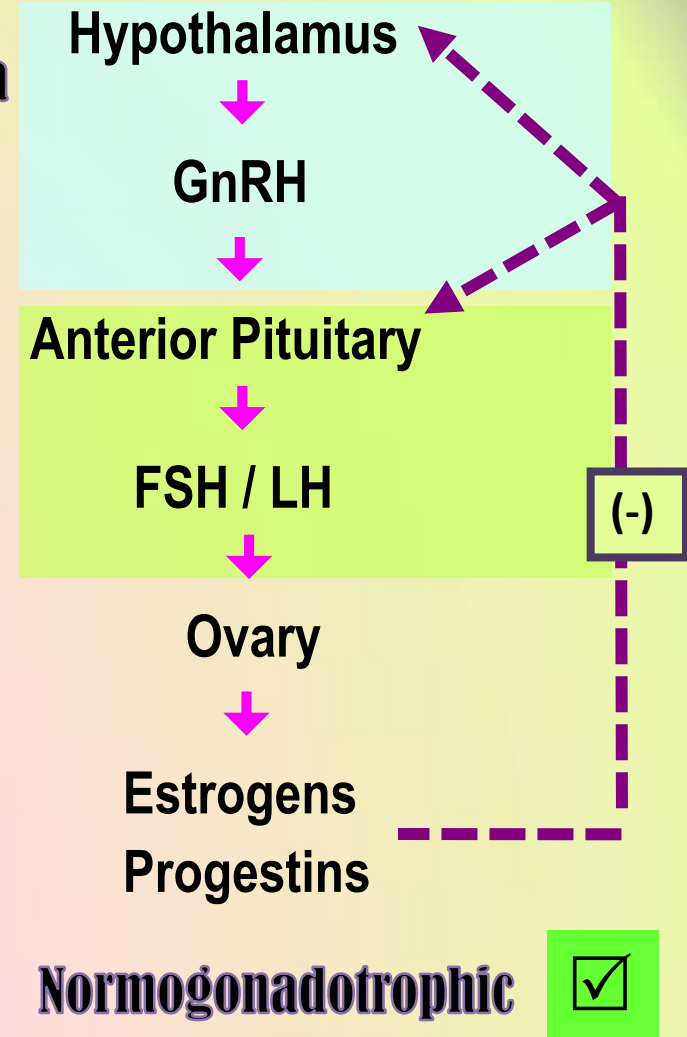
Bromocriptine

3. Gonadotrophins

HMGs; Menotropin
HCGs; Pregnyl

5. POLYCYSTIC OVARIAN SYNDROME (PCOS)

Clomiphene, Tamoxifen
Metformin



ANTIESTROGENS

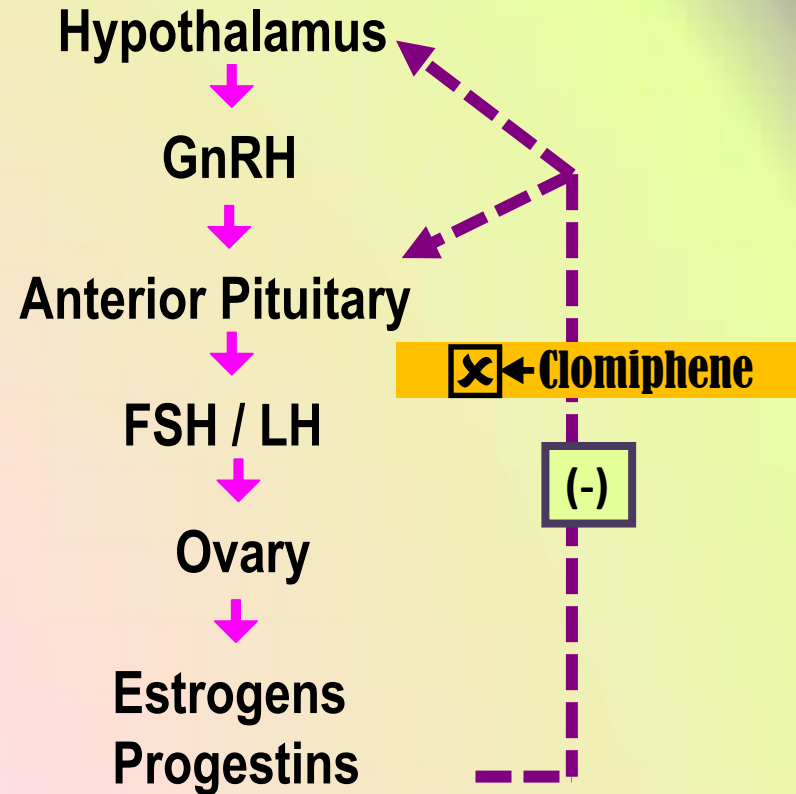
1. CLOMIPHENE

Pharmacological effects

- Compete with estrogen on the hypothalamus and anterior pituitary gland; ↓ negative feed back of endogenous estrogen → ↑GnRH → ↑production of FSH & LH → **OVULATION**

Indication

- Female infertility; not due to ovarian or pituitary failure → **Normogonadotrophic**
- The success rate for ovulation → 80% & pregnancy → 40% .

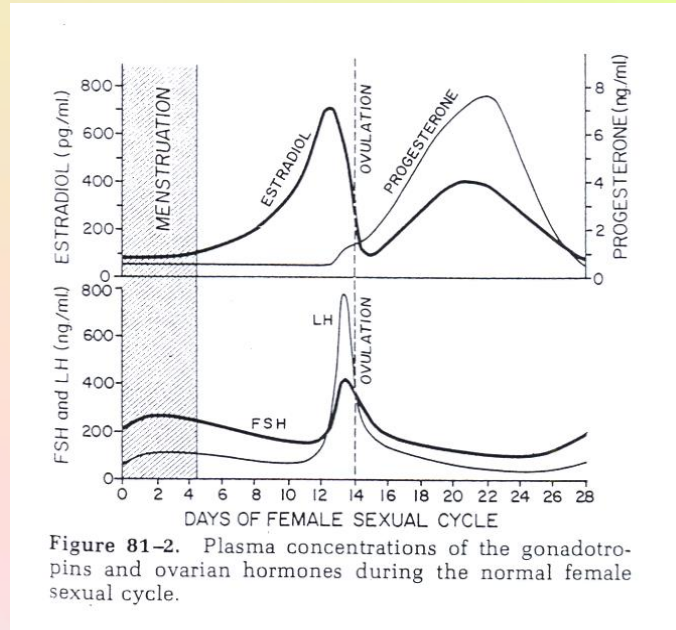


Method of administration

Clomiphene given → 50 mg/d for 5 days from 5th day of the cycle to the 10th day.

If no response give 100 mg for 5 days again from 5th to 10th day

Each dose can be repeated not more than 3 cycles .



ADRs

1. Hot Flashes & breast tenderness
2. Gastric upset (nausea and vomiting)
3. Visual disturbances (reversible)
4. ↑ nervous tension & depression
5. Skin rashes
6. Fatigue
7. Weight gain
8. Hair loss (reversible)
9. Hyperstimulation of the ovaries & high incidence of multiple birth (75% twins).



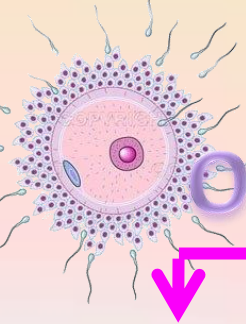
2. TAMOXIFEN

Is similar & alternative to clomiphene
But differ in being **Non Steroidal**.

- It is a good alternative to clomiphene in women with PCOS and clomiphene- resistant cases.
- Used in palliative treatment of estrogen receptor- positive breast cancer.

But why not clomiphene ?





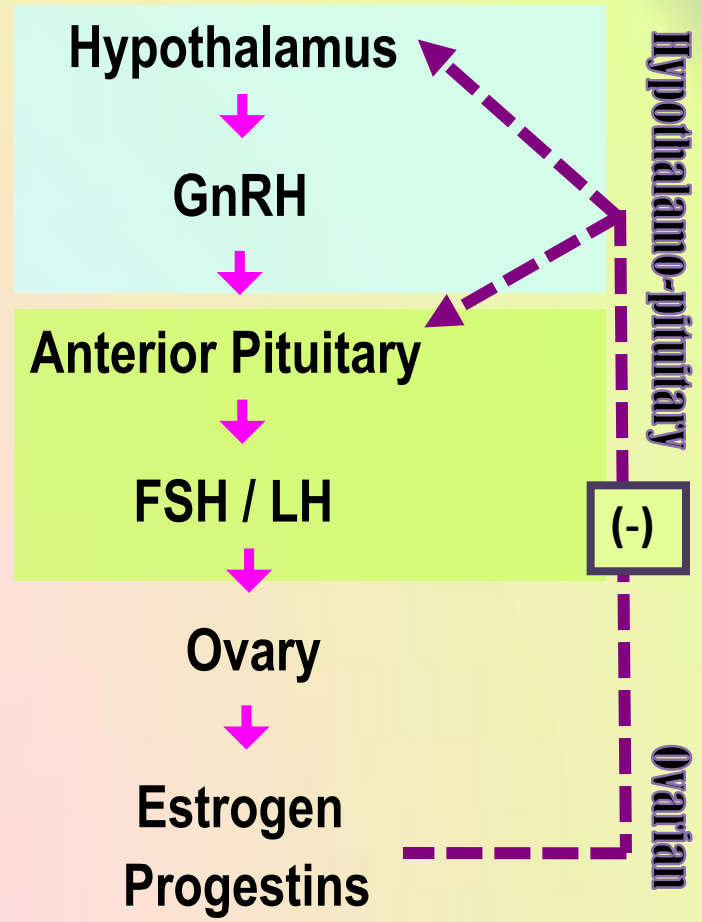
Ovulation Induction

1. Antiestrogens

SERMs;
Clomiphene
Tamoxifen

2. GnRH

GnRH-agonists
Leuprolin
Goserelin



2. GONADOTROPIN RELEASING HORMONE (GnRH)

Uses:

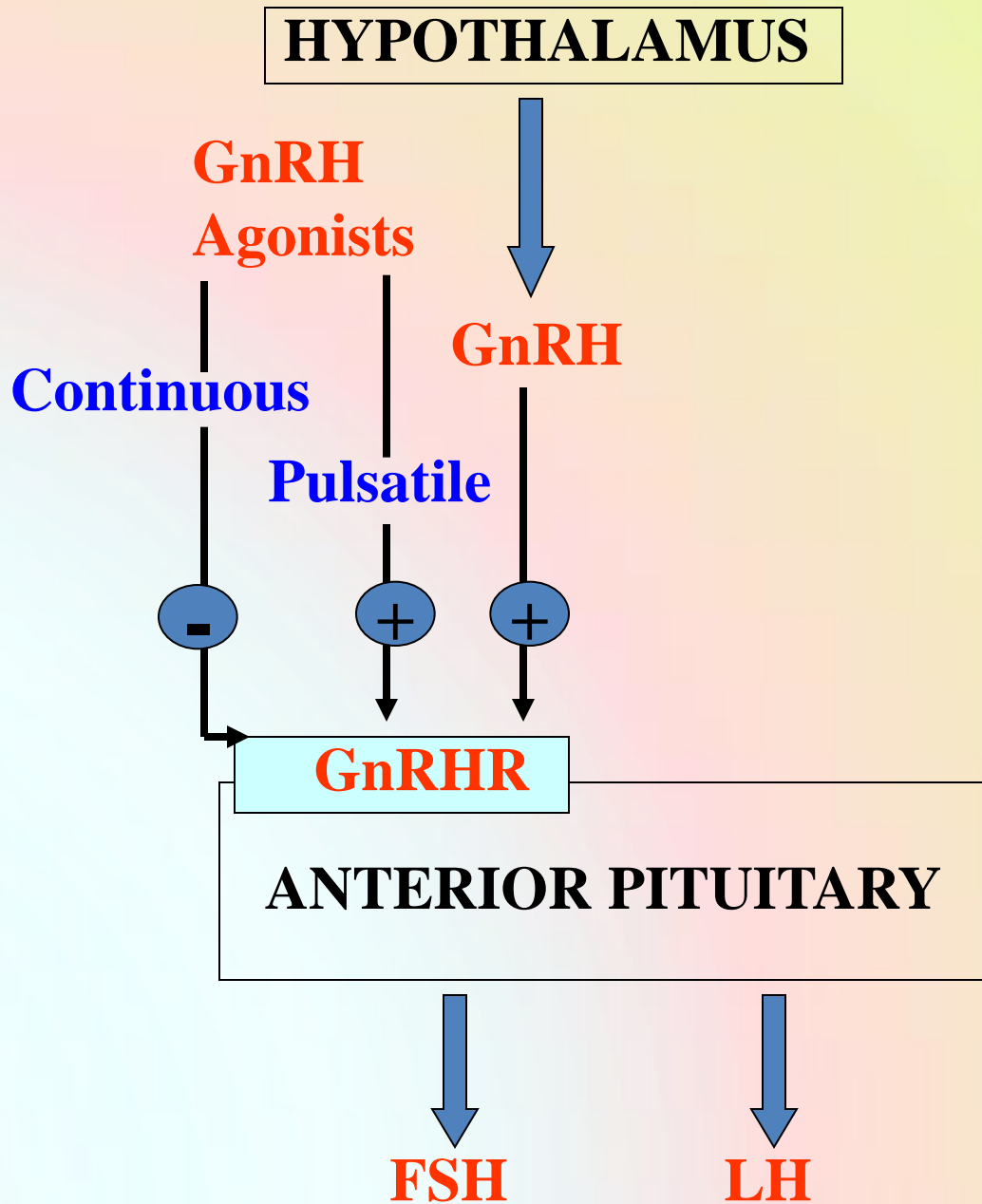
Induction of ovulation in patients with hypothalamic amenorrhea (GnRH deficient)

Analogues with agonist activity:

Leuprolin, Goserelin

GnRH and agonists, given S.C. in a **pulsatile(drip)** to stimulate gonadotropin release (1 – 10 μg / 60 – 120 min)
Start from day 2-3 of cycle up to day 10

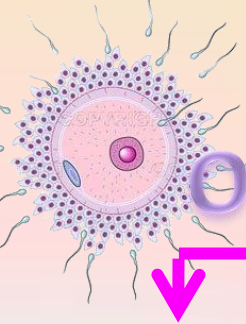
Given **continuously(paradoxical opposite effect)**, when gonadal suppression is desirable e.g. precocious puberty and advanced breast cancer in women and prostatic cancer in men.



ADRs OF GnRH Agonists

- **GIT disturbances, abdominal pain, nausea....etc**
- **Headache**
- **Hypoestrogenism *on long term use* ➔**
 - ◆ **Hot flashes**
 - ◆ **↓ Libido**
 - ◆ **Osteoporosis**
 - ◆ **Rarely ovarian hyperstimulation ➔ (ovaries swell & enlarge)**





Ovulation Induction

1. Antiestrogens

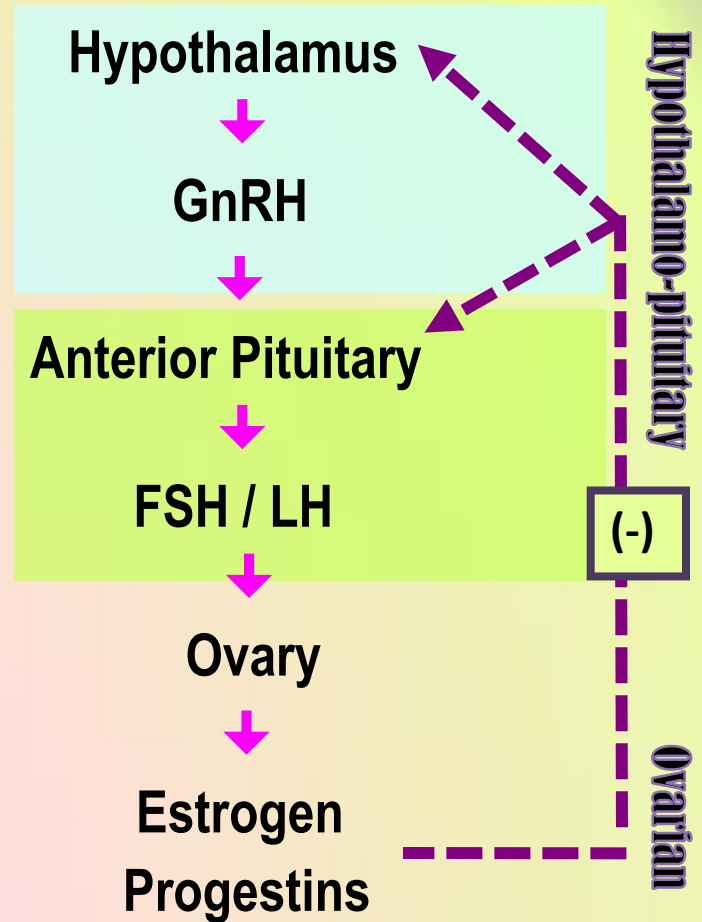
SERMs;
Clomiphene
Tamoxifen

2. GnRH

GnRH-agonists
Leuprolin
Goserelin

3. Gonadotrophins

HMGs; Menotropin
HCGs; Pregnyl



3. GONADOTROPHINS

[FSH & LH]

Are naturally produced by the pituitary gland

For therapeutic use, extracted forms are available as;

1. Human Menopausal Gonadotrophin(hMG) → extracted from postmenopausal urine → contains LH & FSH → **MENOTROPIN**
2. Human Chorionic Gonadotrophin(hCG) extracted from urine of pregnant women → contains mainly LH) → **PREGNYL**

Indication

- Stimulation & induction of ovulation in infertility 2ndry to gonadotropin deficiency (pituitary insufficiency)

Success rate for inducing ovulation is usually $\geq 75\%$



GONADOTROPHINS

Method of administration

hMG is given i.m every day starting at day 2-3 of cycle for 10 days followed by **hCG** on (10th - 12th day) for ovum retrieval .

ADRs

FSH containing preparations; Fever
Ovarian enlargement (hyper stimulation)
Multiple Pregnancy (approx. 20%)

LH containing preparations; Headache & edema

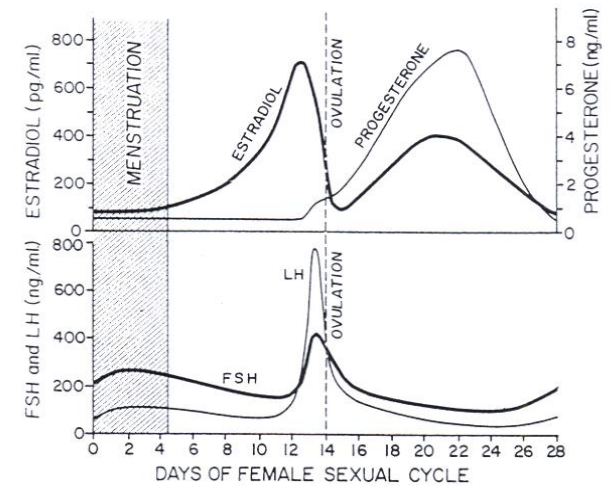


Figure 81-2. Plasma concentrations of the gonadotropins and ovarian hormones during the normal female sexual cycle.



4. Hyperprolactinaemia

D₂ R Agonists

BROMOCREPTINE

Is an ergot derivative(not a hormone)

Mechanism D₂ R Agonists binds to dopamine receptors in the anterior pituitary gland & inhibits prolactin secretion .

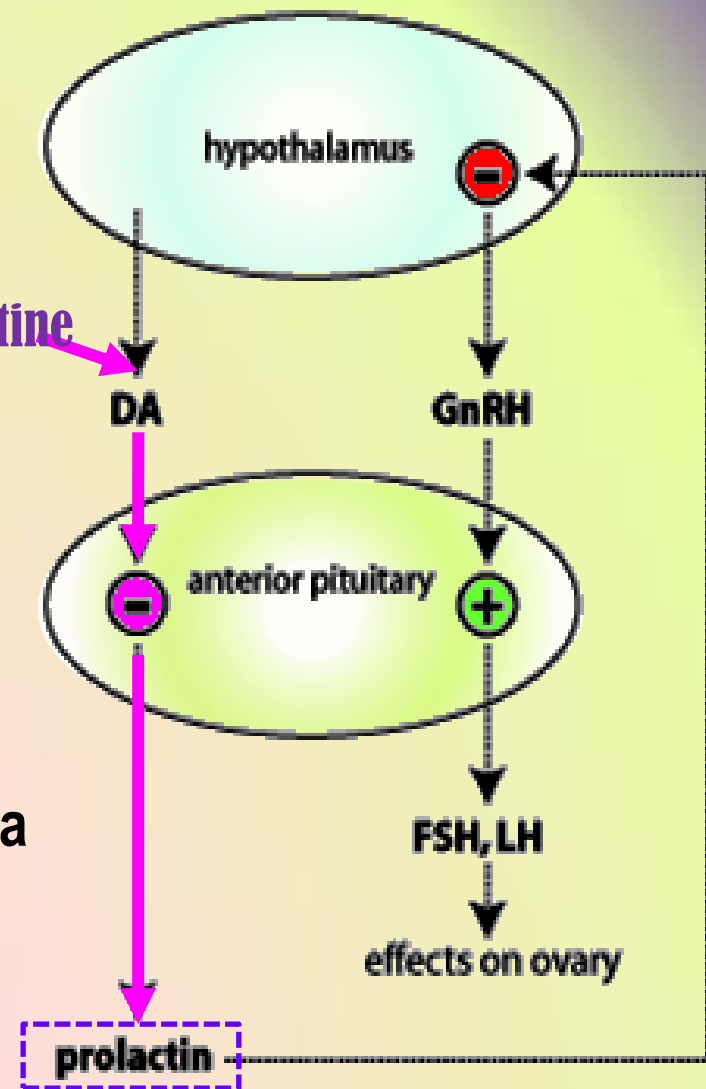
Indications

➤ Female infertility 2ndry to hyperprolactinaemia

ADRs

- GIT disturbances; nausea, vomiting, constipation
- Headache dizziness & orthostatic hypotension
- Dry mouth & nasal congestion
- Insomnia

Bromocriptine



Hyperprolactinaemia

No Ovulation



5. POLYCYSTIC OVARIAN SYNDROME (PCOS)

Most common cause of infertility

The exact cause of PCOS is unknown

Insulin resistance may play a role ???

Metformin

Clomiphene also used

Drugs In OVULATION INDUCTION

G
L
U
O
O
C
K
D

