OBG

RR-8.0

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GYNAECOLOGY : PART 1

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Gametogenesis

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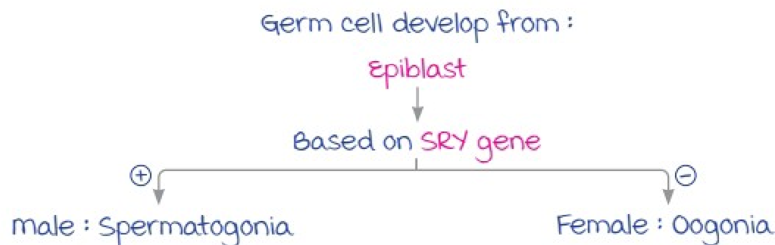
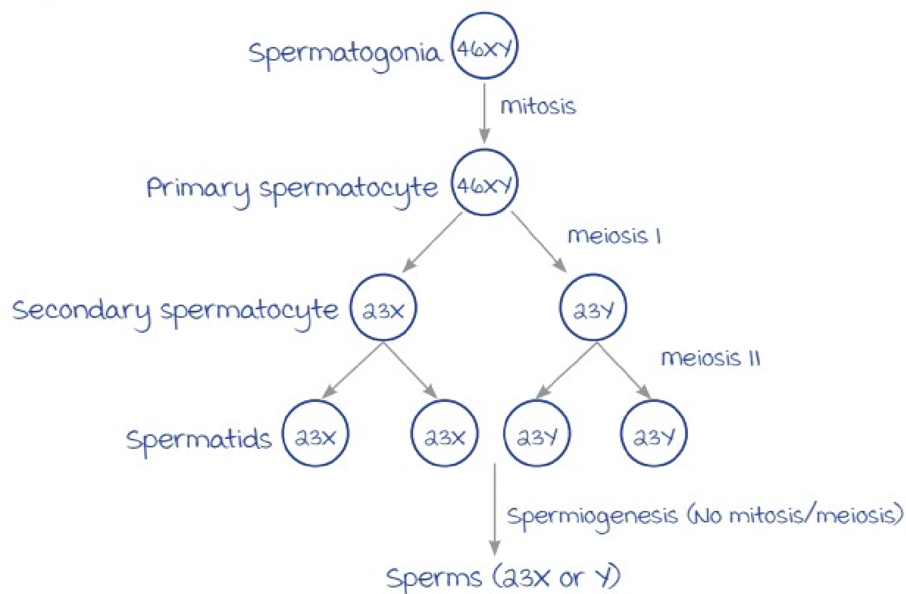


Spermatogenesis :



- Spermatogenesis begins at : Puberty.
- Spermatogenesis occurs in : Seminiferous tubules.
- Size of sperms : 50-60 microns.
- Fertilizable span : 48-72 hours.
- Time taken for spermatogenesis : 70-75 days (72 days).
- Sperms attain maturity in : Proximal end of epididymis.
- Sperms attain motility in : Distal end of epididymis.
- Time taken for sperm maturation : 12-14 days.
- Total time taken to form mature sperm : ≈ 90 days (74 + 14 days).

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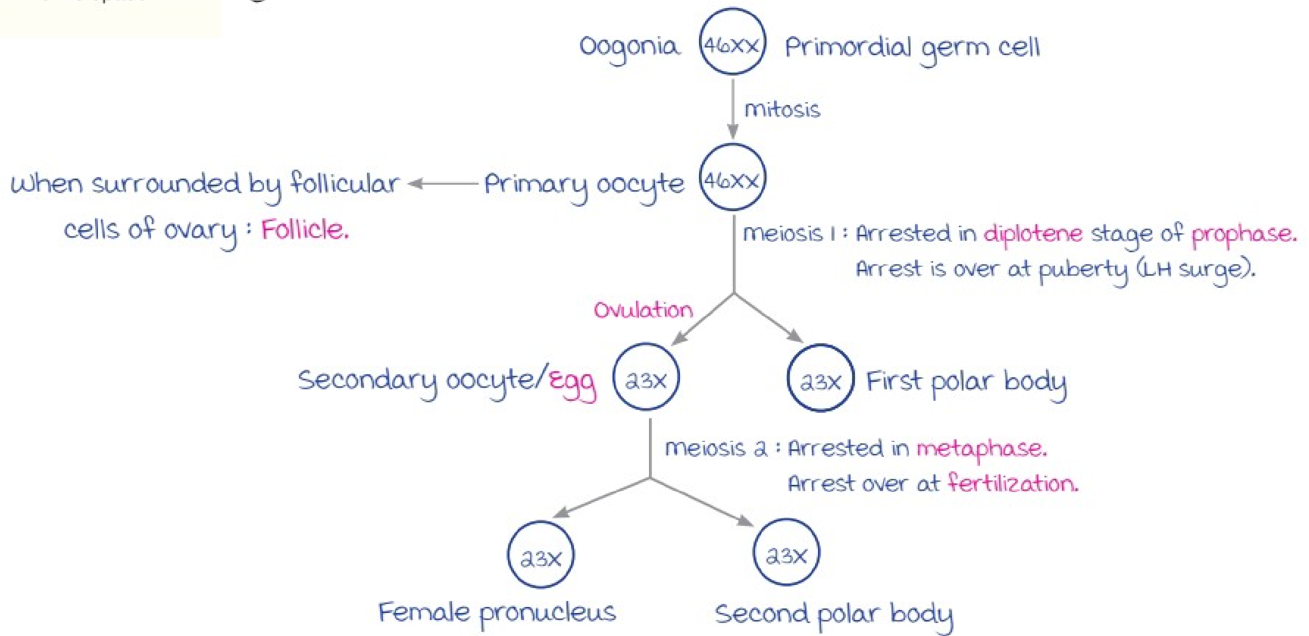
Oogenesis :



- Oogenesis begins : Intrauterine.
- Fertilisable span of ova : 12-24 hours.
- Size of mature follicle : 18-20 mm (Graafian follicle).
- Number of follicles :
  - Maximum : 6-7 million at 5th month of intrauterine life. (20 weeks of pregnancy).
  - At birth : 1-2 million.
  - Puberty : 4-5 lakh.
- Follicles undergo apoptosis.

Menstrual Cycle

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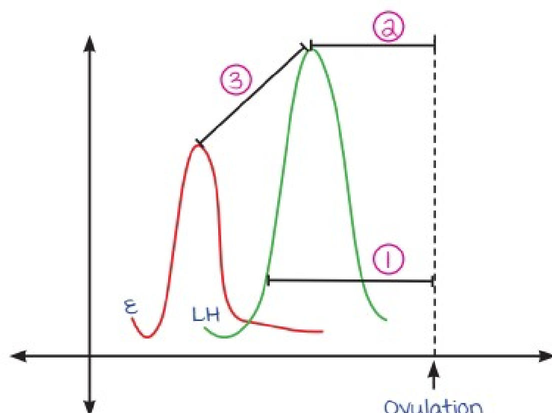
1st half of cycle	LH surge
• Called as : Proliferative/follicular phase. • Main hormone : Estrogen. • Ovarian cycle is initiated by : FSH. • Hormones formed by granulosa cells 1. Estrogen (E_2). 2. Inhibin B. 3. AMH (Small antral & pre antral follicles). • Estrogen effect on FSH : Negative. • Estrogen effect on LH : Negative, except when >200 pg for 48 hrs → LH surge. • Inhibin effect on FSH : Negative.	• LH surge is initiated by : Estrogen (≥200 pg for 48 hrs). • LH surge is maintained by : Estrogen + progesterone. • Before ovulation : Both LH & FSH surge. • Ovulation is due to : LH surge. • LH acts on Theca cells → Androgens • Androgens —(Aromatase / Adipose tissue)→ Estrogen (E_1). – In granulosa cells : Androgens → Estrogen(E_2).

Ovulation
• Primary oocyte → Secondary oocyte/Egg • Follicle → Corpus luteum
Time between
1. LH surge and ovulation : 32-36 hrs (Best), 24-36 hrs. 2. LH peak and ovulation : 10-12 hrs. 3. Estrogen peak and LH peak: 12-24 hrs.

2nd half of cycle
• AKA : Secretory/Luteal phase • Main hormone : Progesterone
Progesterone
• In low concentration : +ve on LH, FSH. • In high concentration : -ve on LH, FSH.
Note
Time duration of luteal phase fixed to : 14 days.



Note : Granulosa cell tumors.
Tumor markers → Inhibin B & AMH.

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Corpus Luteum :

- Corpus luteum in non-pregnant females is maintained by : LH.
- Corpus luteum in pregnant females is maintained by : hCG.
- Life span of corpus luteum in non-pregnant females : 12-16 days.
- Hormone which prevents luteolysis : hCG.
- Maximum size and activity of corpus luteum is seen on : 8 days after ovulation (D-22).
- Maximum progesterone is seen on : D-22.
- Minimum LH & FSH is seen on : D-22.
- All tests for ovulation done on : D-22 = 1 week before menstruation.
- Day of ovulation : 14 days prior to next menstruation (Length of cycle - 14 days).
- Pain at time of ovulation (mid cycle abdominal pain) : Mittelschmerz syndrome.

Dysmenorrhea :

Pain at time of menstruation.

	Primary/Spasmodic dysmenorrhea	Secondary/Congestive dysmenorrhea
Pathology	Progesterone (Relaxant) withdrawal ↓ Vasoconstriction ↓ Release of PGF-2α → Pain. (No pelvic pathology)	Causes : Pelvic pathologies • Endometriosis (m/c) • Adenomyosis • Fibroid • Pelvic inflammatory disease
Presentation	Young female, c/o pain since menarche except initial few cycles (Anovulatory)	• Reproductive age group female (≥30) • c/o pain at the time of menstruation • No h/o pain
Pain location	Suprapubic area (Generalized)	Localised
Pain character	Just before or at menstruation; Relieved within 72 hours.	Begins much before menstruation, and remains after menses.
Pain progression	Pain decreases on its own : • After physical act. • Marriage. • Child birth	Pain increases progressively
P/V	Ⓝ	Abnormal
Rx	• NSAIDs or • OCPs (makes the cycles anovulatory)	Manage the cause

Drugs in Gynaecology

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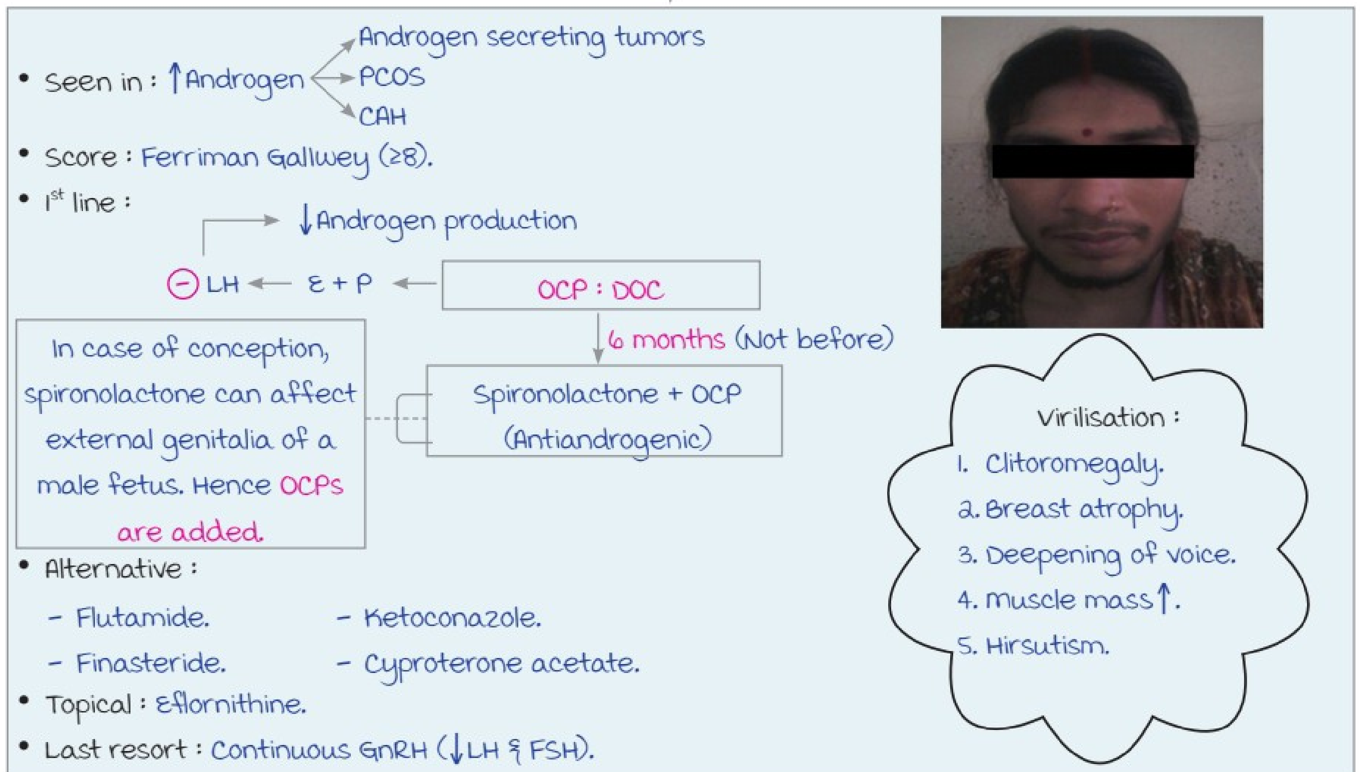
Third generation/Artificial progesterone	Drugs for endometriosis/dysmenorrhea (Hyperestrogenic condition : Rx → ↓Estrogen)
• As generation increases : Androgenic side effects decrease. • Third generation : - Desogestrel - Norgestimate - Gestodene • Least androgenic side effect ← (Desogestrel, Norgestimate, Gestodene) • 4th generation : Cyproterone acetate (Anti androgenic)	Minimal-Mild : • 1st line : NSAIDs/OCPs. • 2nd line : Progesterone (Downregulates estrogen receptor). • 3rd line : GnRH continuous. • If no relief : Laparoscopic management. Moderate-Severe : • 1st line : Continuous GnRH. • If no relief : Laparoscopic management.

DRUGS IN GYNAECOLOGY

Hirsutism :
Hair growth in male pattern + Alopecia + Acne



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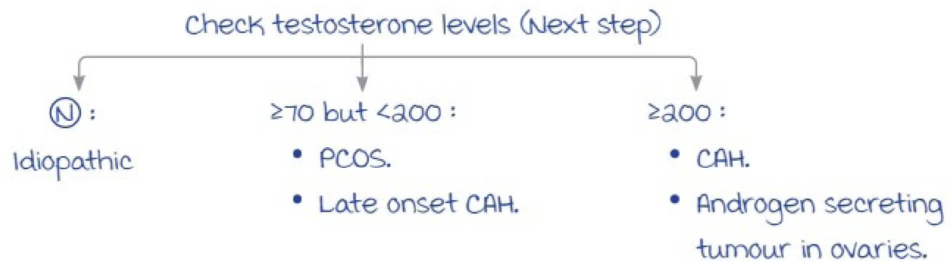
Note :

Drug not used for hirsutism : Danazol (Causes hirsutism).

Androgens in females :

Female with hirsutism :



- m/c cause of hirsutism in young : PCOS.
- m/c cause of rapid onset hirsutism in young females : Androgen secreting tumour of ovaries.

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DRUGS IN GYNAECOLOGY

SERM : Selective Estrogen Receptor Modulator
Clomiphene :
• Use : Ovulation induction (If HPO axis intact i.e FSH Ⓝ).
• Most common side effect : Hot flushes.
• 2nd most common side effect : Formation of ovarian cyst.
• Chances of multiple pregnancy : 7-10%.
• Side effect because of which its use should be stopped immediately : Visual disturbances.
• Common S/E : Vaginal dryness

Ospemifene :
Mx vaginal dryness.

Ormiloxifene :
Component of centchroman (Chhaya).

Raloxifene
• Use : Osteoporosis.
• Side effect : Hot flushes, vaginal dryness.
Tamoxifen
• Use : Breast cancer.
• Side effect : Hot flushes, vaginal dryness.
Leads To : Endometrial Ca.
Minimum time gap between tamoxifen & pregnancy : 2 months. Ideal gap : 3 months. } Teratogenic.

Drugs for Fibroid :
1st line : D's which decrease bleeding but NOT size of fibroid
1. Tranexamic acid.
2. OCP.
3. Progesterone.
2nd line : D's which decrease size of fibroid & bleeding
Drugs Decrease Estrogen :
1. Letrozole (Androgen —Aromatase ✗→ Estrogen)
2. Danazole (S/E : Hirsutism)
3. GnRH analogues (Continuous)
4. GnRH antagonist
Progesterone :
1. SPRM : Ullipristal (Also as emergency contraceptive)
2. Progesterone antagonist : Mifepristone (RU 486 : Medical abortion).

SPRM : Selective Progesterone Re-uptake Modulator.

GnRH :
Synthetic Analogue : Leuprolide, Goserelin.
Route : • S/c injections. • Intranasal spray. } (Orally inactive).
Uses : Pulsatile = ↑ E, ↑LH, ↑FSH
1. Delayed puberty.
2. Kallmann syndrome.
3. Anovulation.
Continuous GnRH = ↓E, ↓androgen, ↓LH, ↓FSH.
1. Fibroid
2. Endometriosis
3. Precocious puberty
4. Hirsutism
5. ER +ve breast cancer
6. Prostate cancer

(Items 1–5: Rx : Hyper estrogenic conditions.)

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Note :

GnRH antagonist.

- Elagolix.
- Cetrorelix.

} Usually active but expensive.

- Used same as continuous GnRH.

Abnormal Uterine Bleeding

00:45:34

Normal characteristics of menstrual cycle :

- Length of cycle : 24-38 days (Old : 21-35 days).
- No. of days bleeding : 4.5-8 days (Old : 2-8 days).
- Volume of blood loss : 20-80 mL.
- Cycle to cycle variation : 2-20 days.

Abnormal Uterine Bleeding

Any deviation from normal characteristics of menstrual cycle.

Causes : PALM COEIN.

- Polyp.
- Adenomyosis.
- Leiomyoma.
- Malignancy/hyperplasia.
- Coagulopathy.
- Ovulatory dysfunction.
- Endometrial cause.
- Iatrogenic.
- Not yet classified.

Investigation :

- 1st : UPT except post-menopausal/virgin female.
- 2nd : TVS except puberty menorrhagia (D/t anovulation > coagulopathy).
- 3rd : Endometrial biopsy.

Endometrial Biopsy/Endometrial Aspiration Cytology/Endometrial Sampling

Indications :