Menstrual cycle disorders and infertility

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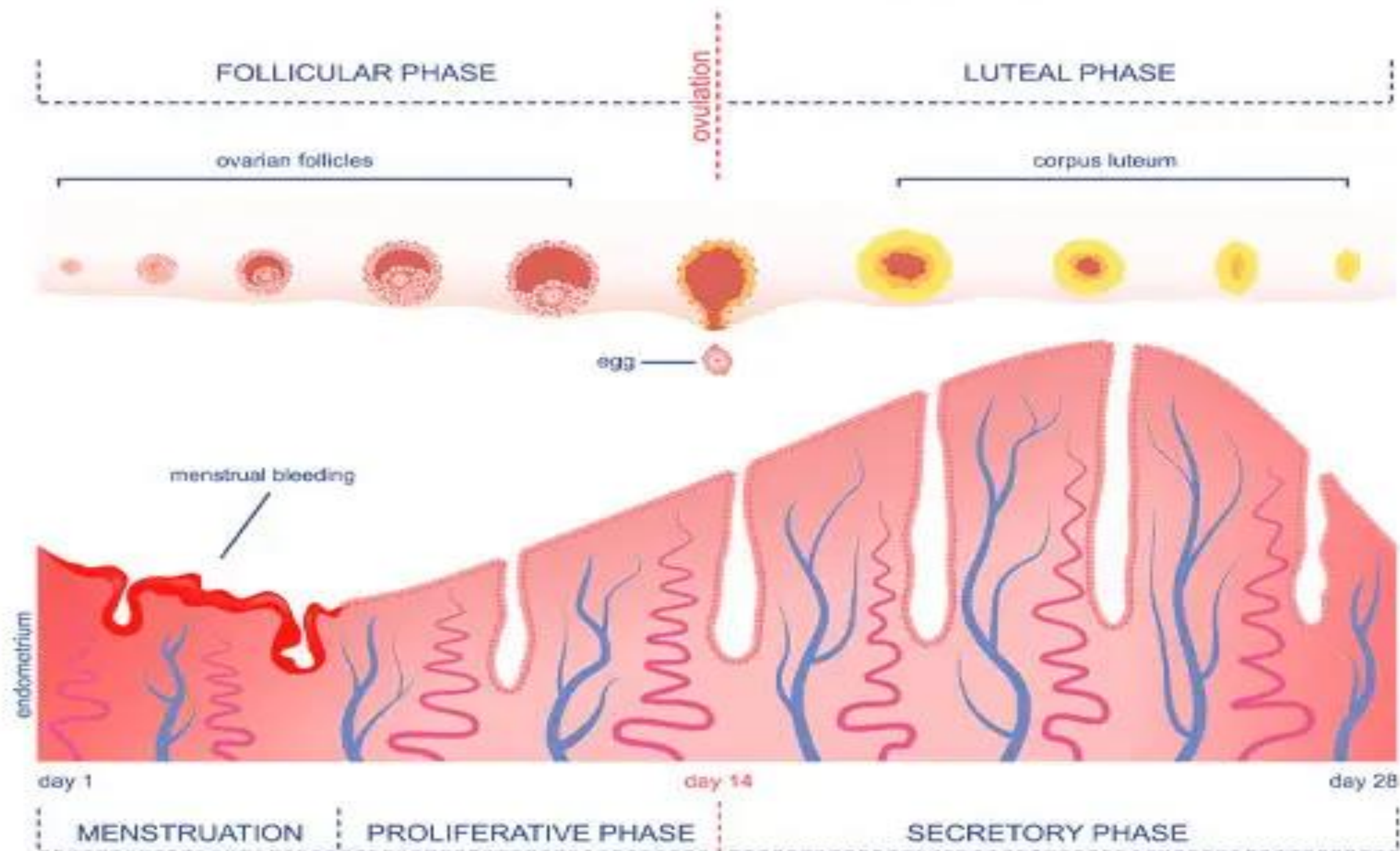
Menstruation

the cyclic, orderly sloughing of the uterine lining, in response to the interactions of hormones produced by the hypothalamus, pituitary, and ovaries.


MENSTRUAL CYCLE
FOLLICULAR PHASE
ovulation
LUTEAL PHASE
ovarian follicles
corpus luteum
egg
menstrual bleeding
endometrium
day 1
day 14
day 28
MENSTRUATION
PROLIFERATIVE PHASE
SECRETORY PHASE

- The **menses phase** starts from Day 1 – Day 5(up to 7 days) , during which the lining of the uterus sheds out through the vagina

- The **follicular phase** usually take place from Day 6 – Day 14, during which the lining of the uterus thickens due to the production of the hormone oestrogen.

- The **luteal phase** lasts from Day 15 – Day 28. After ovulation occurs,

the lining of the uterus further thickens in preparation for pregnancy. If the egg is fertilised by a sperm and attached itself to the uterine lining, the woman becomes pregnant.

If pregnancy does not occur, then the thickened lining of the uterus sheds during the menstrual period.

Ovulation

the rupture of the dominant follicle of the ovary.

This releases an egg into the abdominal cavity.

It then is taken up by the fimbriae of the fallopian tube where it has the potential to become fertilized.

Normal Menstrual Cycle

- **Frequency of menses (or length of menstrual cycle)**

  Mean is 28 days +/- 7 days

  initially irregular

- **Duration of menstruation**

  Normal 4– 8 days; prolonged >8 days, shortened <4.5 days.

  Mean is 5 days

- **Volume of monthly menstrual blood loss**
- Mean 40 ml; heavy is >80 ml; light is <5 ml.

- **Regularity of menstrual cycle (cycle to cycle length variation over 12 months, measured in days)**

  7-10 days

Primary Dysmenorrhoea

- Abdominal Pain associated with menstruation
- usually cramping in nature and occurs in the lower abdomen or pelvis but may radiate to the back or down the thighs.
- It may commence before the onset of bleeding and usually lasts 8–72 hours.
- Associated symptoms include nausea and vomiting, fatigue and headache.

Pathophysiology

- Physiological , no underlying pathology
- Usually associated with ovulatory cycle

- Uterine contraction and vasoconstriction
- Modulation and stimulation of pain fibres
- Psychological and behavioural causes

Secondary dysmenorrhoea

Due to organic or psycho-sexual causes

Usually occurs years after the menarche

pain may occur throughout the luteal phase as well as during menstruation.

Deep dyspareunia may also be present

Causes

- Endometriosis
- Adenomyosis
- PID
- IUCD in utero
- Pelvic adhesions
- Fibroids
- Cervical stenosis
- Congenital abnormalities causing genital tract obstruction

Premenstrual syndrome (PMS)

Most women experience a certain degree of premenstrual symptoms before menstruation.

Physiological when the severity of symptoms is not enough to have a serious impact on the quality of life, but is noticeable to the woman.

Symptoms occur in a cyclical nature with a symptom free week in the follicular phase.

PMS classifications

Core premenstrual disorders (PMDs)

Premenstrual exacerbation of an underlying disorder', such as diabetes, depression, epilepsy, asthma

Non-ovulatory PMDs : occur in the presence of ovarian activity without ovulation

Progestogen-induced PMDs :caused by exogenous progestogens present in hormone replacement therapy (HRT) and the combined oral contraceptive (COC) pill.

PMDs with absent menstruation' include women who still have a functioning ovarian cycle, but for reasons they do not menstruate

Core premenstrual disorders (PMDs)

are the most encountered and widely recognised type of PMS.

As with all PMDs, symptoms must be severe enough to affect daily functioning or interfere with work, school performance or interpersonal relationships.

The symptoms of core PMDs are nonspecific and recur in ovulatory cycles.

They must be present during the luteal phase and abate as menstruation begins, which is then followed by a

symptom-free week.

will have predominantly psychological, predominantly somatic or a mixture of symptoms

Clinical features

- **Physical symptoms:**
- breast tenderness or pain
- abdominal swelling / bloating
- headaches
- skin disorders
- weight gain
- swelling of extremities (hands or feet or both)
- joint pain, muscle pain, back pain.

- **Psychological and behavioural symptoms:**
- mood swings
- Irritability/ anger, aggression
- Anxiety/ depressed mood
- Confusion/ tension
- sleep disturbances
- changes in appetite
- fatigue, lethargy, or lack of energy
- restlessness
- poor concentration
- social withdrawal/ not in control
- lack of interest in usual activities
- Loneliness/ hopelessness

Any menstrual bleeding from the uterus that is either abnormal in volume , regularity, timing or is non-menstrual (IMB, PCB or PMB)

Abnormal uterine bleeding

- **Heavy menstrual bleeding (HMB)**
  subjective diagnosis as it is defined by the woman based on how it interferes with her quality of life.

- **Intermenstrual bleeding (IMB)**
  Uterine bleeding that occurs between clearly defined cyclic and predictable menses.

- **Postmenopausal bleeding (PMB)**
  Genital tract bleeding that recurs in a menopausal woman at least one year after cessation of cycles

- **Postcoital bleeding (PCB)**
  Non-menstrual genital tract bleeding immediately (or shortly after) intercourse

Heavy menstrual bleeding (HMB)

menstrual blood loss (MBL) that is subjectively considered to be excessive by the woman and interferes with her quality of life.

Subjective assessment: combines information of sanitary protection usage, flooding, clots, duration of menstruation and the woman's personal opinion of her menstrual loss.

Objective assessment: does not improve clinical care and is not undertaken in modern clinical practice.

FIGO- PALM-COEIN classification

Polyp
Adenomyosis
Leiomyoma → **S**ub**m**ucosal / **O**ther
Malignancy & hyperplasia

Coagulopathy
Ovulatory dysfunction
Endometrial
Iatrogenic
Not yet classified

Post menopausal bleeding

- Endometrial atrophy
- Endometrial carcinoma
- Polyps
- endometrial Hyperplasia
- Ovarian, tubal, cervical malignancy

Inter-menstrual bleeding

Category	Causes
Infection	• Endometritis/ Cervicitis/ Vulvovaginitis
Iatrogenic	• Breakthrough bleeding/ Secondary to examination/smear test
Structural (benign)	• **Uterine/cervical polyps/fibroids** • Ectropion
Structural (premalignant/malignant)	• Uterine/cervical/vaginal/vulval cancer • CIN/VaiN/VIN • Ovarian estrogen secreting tumours
Natural	• 1–2% of women will have midcycle spotting, associated with ovulation

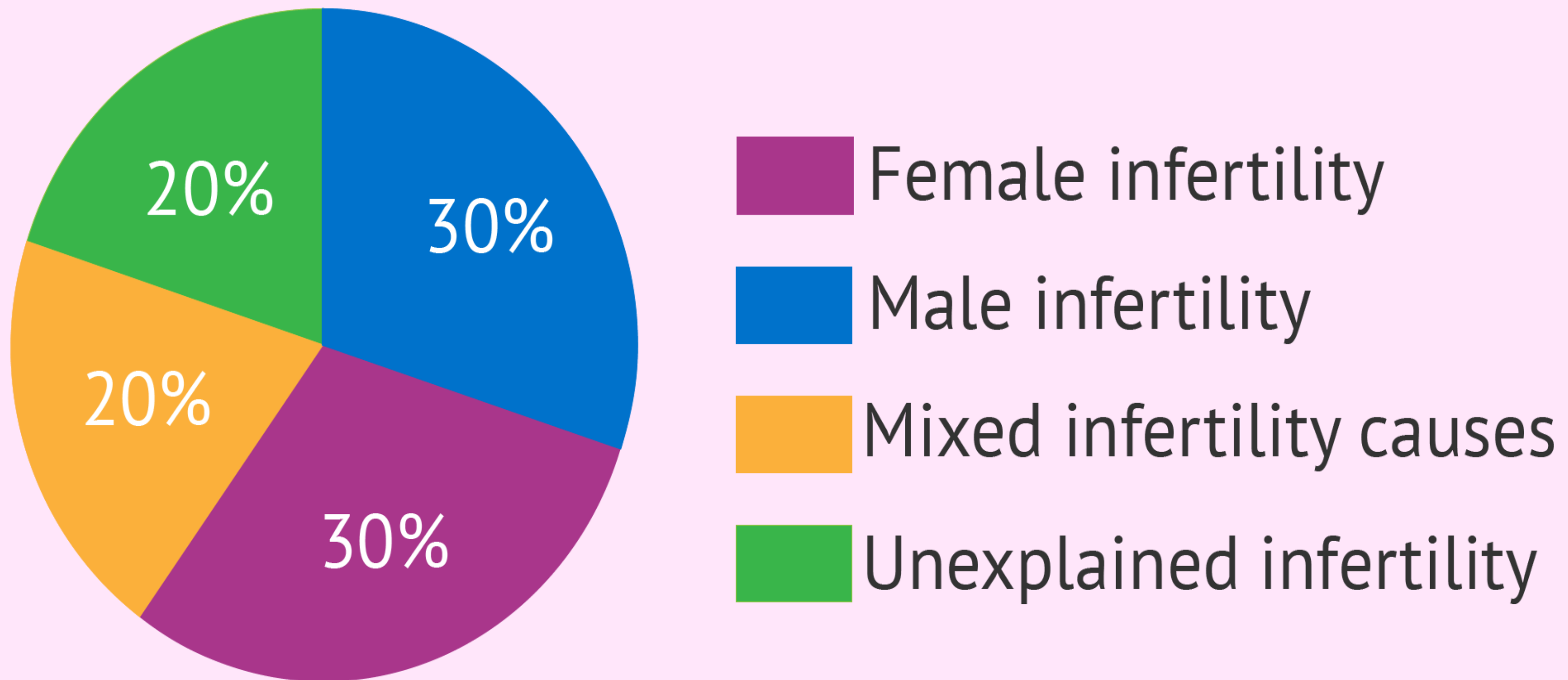
Infertility

Definition

- Inability of the couple to conceive after 1-2 years of regular unprotected sexual intercourse.

- Primary infertility; couple have failed to conceive before.

- Secondary infertility; woman has previously been pregnant regardless of the outcome of the pregnancy and now unable to conceive.


Causes of infertility
20%
30%
20%
30%
Female infertility
Male infertility
Mixed infertility causes
Unexplained infertility

Basic Work-up for Infertility

- Detailed history and physical examination.
- Semen analysis.
- Evidence of ovulation.
  Day 21 progesterone
- Serum prolactin
- Thyroid function tests

Semen analysis: (WHO 2010)

semen volume: 1.5ml or more

- pH: 7.2 or more

- sperm concentration: 15 million spermatozoa per ml or more
- total sperm number: 39 million spermatozoa per ejaculate or more

- total motility: 40% or more motile or 32% or more with progressive motility

- vitality: 58% or more live spermatozoa

- sperm morphology (percentage of normal forms): 4% or more

Evidence of ovulation:

1. Menstrual history of **regular cycles**.

2. **serum progesterone in the mid-luteal phase of their cycle** (day 21 of a 28-day cycle) even if they have regular menstrual cycles.

Ovarian reserve

More important in >35 years old, suspected ovarian failure and to detect response to ovulation induction.

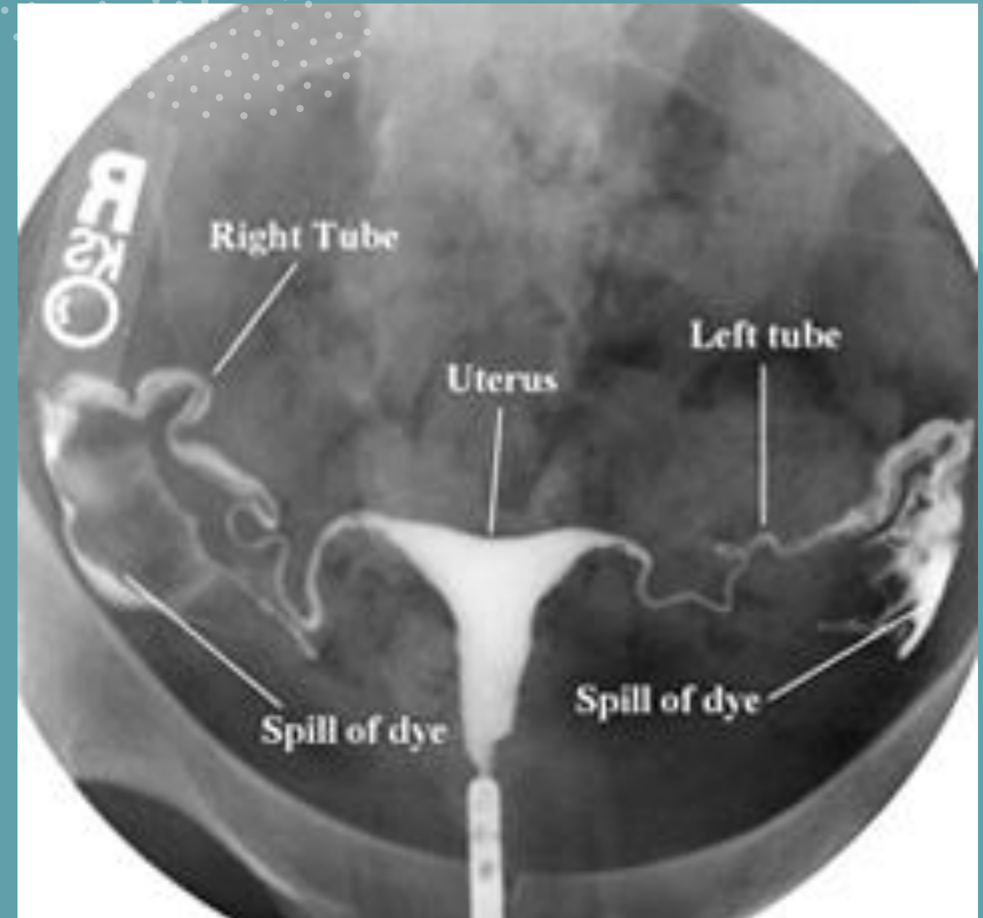
1. Total antral follicle count. (AFC)

2. Anti-Müllerian hormone (AMH) of less than or equal to 5.4 pmol/l for a low response and greater than or equal to 25.0 pmol/l for a high response

3. Follicle-stimulating hormone greater than 8.9 IU/l for a low response and less than 4 IU/l for a high response.

Investigation of suspected tubal and uterine abnormalities:

Hysterosalpingography (HSG)



Treatment of the cause:

- <u>**Ovulation disorders:**</u>
  The WHO classifies ovulation disorders into 3 groups:

  1. Group I: hypothalamic pituitary failure (hypothalamic amenorrhoea or hypogonadotrophic hypogonadism).

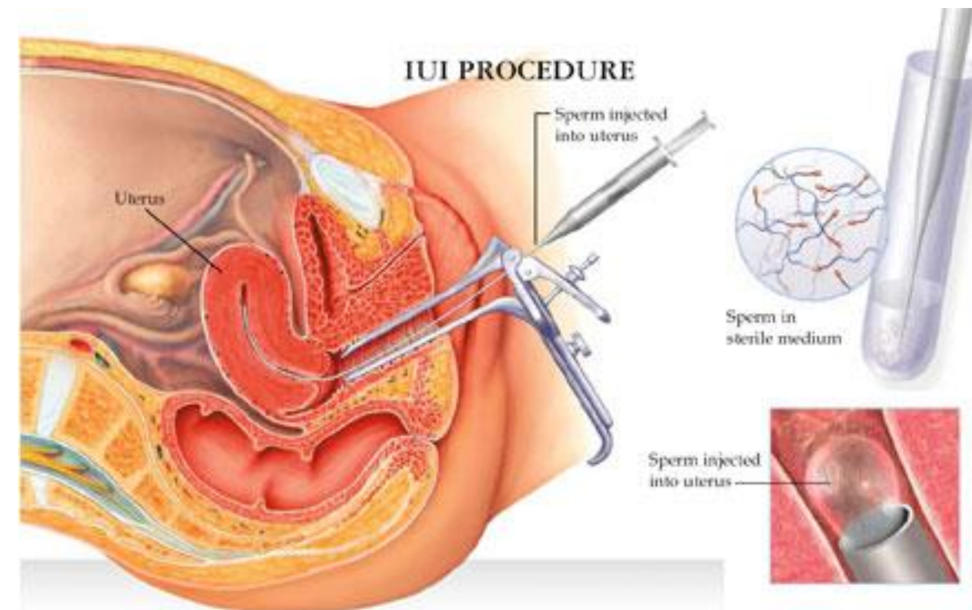
  2. Group II: hypothalamic-pituitary-ovarian dysfunction (predominately polycystic ovary syndrome).

  3. Group III: ovarian failure.

Intrauterine insemination

- It is the artificial introduction of semen inside the female’s uterus.

- Success rate varies, lie between 8-12% per cycle.



IVF/ICSI

- is a process by which the oocyte is fertilized by a sperm outside the body: *in vitro*, and then a gamete retransferred intrauterine.

IVF/ICSI

- IVF/ICSI cycle consists of:
  1. Down-regulation of gonadotrophins.
  2. Controlled ovarian stimulation.
  3. Maturation of oocytes.
  4. Oocytes retrieval.
  5. Fertilization and incubation of the gametes.
  6. Embryo-transfer.
  7. Luteal phase support.

  (and cryopreservation choice offered if good quality embryos are available)

THANK YOU