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LEVEL : 200 level

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Matric: 18/mhs01/180

Questions

1. Discuss ovulation

- This is the release of an oocyte from the ovarian follicle
- 1. In a few days before ovulation, under the influence of **FSH** and **LH**, the secondary follicle grows rapidly to a diameter of about 25 mm to become mature vesicular/ mature secondary or Graafian follicle
- Coincident with final development of the vesicular follicle, there is an **abrupt increase in LH** that causes;
 2. the primary oocyte to complete meiosis I
 3. and the follicle to enter the preovulatory mature vesicular stage
- Meiosis II is also initiated, but the secondary oocyte is arrested in metaphase approximately 3 hours before ovulation
- In the meantime, the surface of the ovary begins to bulge locally, and at the apex, an avascular spot, the stigma, appears
 1. For the oocyte to be released, 2 events occur which are caused by LH surge:
 - I. it increases collagenase activity, resulting in digestion of collagen fibers (connective tissue) surrounding the follicle
 - II. Prostaglandin levels also increase in response to the LH surge and cause local muscular contractions in the ovarian wall
 1. Those contractions extrude the oocyte, which together with its surrounding follicular (granulosa) cells from the region of the cumulus oophorus,
 2. this causes **ovulation in which oocyte floats out of the ovary**
 3. Some of the cumulus oophorus cells then rearrange themselves around the zona pellucida to form the corona radiata
- v. **Note:**
 - Ovulation is triggered by a surge of LH production
 - Ovulation usually follows the LH peak by 12 to 24 hours
 - The **LH surge**, elicited by the high estrogen level in the blood, appears to cause the stigma to balloon out, forming a vesicle

Clinical correlates

- i. During ovulation, some women feel a variable amount of abdominal pain called ***mittelschmerz*** also known as ***middle pain*** because it normally occurs near the middle of the menstrual cycle
- ii. In these cases, ovulation results in slight bleeding into the peritoneal cavity, which results in sudden constant pain in the lower abdomen.
- iii. *Mittelschmerz* may be used as a symptom of ovulation, but there are better symptoms, such as the slight drop in basal body temperature
- iv. Some women fail to ovulate, this is called ***anovulation***, because of a low concentration of gonadotropins
 - 1. In these cases, administration of an agent to stimulate gonadotropin release and hence ovulation can be employed
 - 2. Although such drugs are effective, they often produce multiple ovulations, so that the risk of multiple pregnancies is 10 times higher in these women than in the general population

2 differentiate between meiosis one and meiosis 2

Meiosis 1	Meiosis 2
Prophase stage consist of synapsis, crossing over and chiasma formation	No synapsis, no crossing over , no chiasma formation
Centromeres do not split at anaphase 1	Centromeres split at anaphase 2
23 duplicated chromosomes	23 single chromosomes
reduction	division
Reduces ploidy levels from 2n to n	Divides the remaining sets of chromosomes

3. Differentiate between monozygotic and dizygotic twins

Monozygotic	Dizygotic
Also called “identical twins”	Also called “fraternal twins”
May have the same physical and mental characteristics	May look alike or different; may behave similarly or differently
Developed from a single egg which was fertilized by a single sperm cell	Developed from two eggs fertilized by two different sperm cells
Two fetuses grow in the same placenta	Two fetuses grow in two different membranes

Have almost identical genetic profile	Completely different genetic profile
Always of the same sex	May be of the same or opposite sex