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**Dept: MED & SURGERY 200 lvl**

**Mat No: 18/MHS01/198**

 **EMBRYOLOGY ASIGNMENT**

1. **Discuss Ovulation**

Ovulation is the release of an oocyte from the ovarian follicle, so therefore, in a few days before ovulation, under the influence of ***FSH*** & ***LH***, the secondary follicle grows rapidly to a diameter of about 25mm 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;

1. The primary oocyte to complete meiosis 1
2. And the follicle to enter the preovulatory mature vesicular stage

**NOTE;**

1. Ovulation is triggered by a surge of **LH** production
2. Ovulation usually follows the **LH** peak by 12 to 24 hours
3. The **LH surg**e, elicited by the high estrogen level in the blood, appears to cause the stigma to balloon out, forming a vesicle.

***Clinical Correlates***

1. During ovulation, some women feel a variable amount of abdominal pain called ***Mittelschmer*** also known as **middle pain** because it normally occurs near the middle of the menstrual cycle.
2. In these cases, ovulation results in slight bleeding into the peritoneal cavity, which results in sudden constant pain in the lower abdomen.
3. Mittelschmerz may be used as a symptom of ovulation, but there are better symptoms, suchas the slight drop in basal body temperature.
4. Some women fail to ovulate, this is called **anovulation**, because of low concentration of gonadotropins
* In these cases, administration of a agent to stimulate gonadotropin release and hence ovulation can be employed
* 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.***
1. Differentiate between Meosis 1 & Meosis 2

 ***MEOSIS 1***

 Events that occur during meosis 1 includes the following;

1. ***Synapsis***; pairing of 46 homologous duplicated chromosomes.
2. ***Crossing over***; exchange of large segments of DNA.
3. ***Alignment***; alignment of 46 homologous duplicated chromosomes at the metaphase plate.
4. ***Disjunction***; separation of 46 homologous chromosomes from each other; **centromeres do not split!**
5. ***Cell division***; formation of two secondary gametocytes(23 duplicated chromosomes,2n)

 ***WHILE...........***

 ***MEOSIS 2***

Events t**h**at occur during meiosis 2 include the following

1. ***Synapsis*;** absent.
2. ***Crossing over***; absent.
3. ***Alignment***; alignment of 23 duplicated chromosomes at the metaphase plate.
4. ***Disjunction*** ; separation of 23 duplicated chromosomes to form 23 single chromosomes; **centrometers split!**
5. ***Cell division*** ; formation of four gametes ( 23 single chromosomes, 1n)
6. Discuss the stages involved in fertilization
7. ***Passag****e* ***of a sperm through the corona radiata***; For sperms to pass through the corona radiata, they must have been capacitated (removal of the glycoprotein coat and seminal plasma proteins from the plasma membrane that overlies the acrosomal region of the spermatozoa)
8. ***Penetration of the zona pellucida***; Zona glycoprotein binds with the intact acrosome of the sperm on the zona pellucida, release of the acrosomal enzymes(acrosin) allows sperm to penetrate the zona pellucid, as soon as the head of a sperm comes in contact with the oocyte surface, the permeability of the zona pellucid changes, when a sperm comes in contact with the oocyte surface, lysosomal enzymes are released from cortical granules lining the plasma membrane of the oocyte.
9. ***Fusion of plasma membranes of the oocyte & sperm***; The plasma or cell membranes of the the oocyte and ssperm fuse and breakdown at the area of fusion, the head and tail of the sperm enter the cytoplasm of the oocyte, but the sperm’s plasma membrane remains behind.
10. ***Completion of the second meiotic division of oocyte and formation of female pronucleus;*** Penetration of the oocyte by a sperm activates the oocytes into completing the second meiotic division & a second polar body, the nucleus of the mature ovum/oocyte is now called the ***female pronucleus.***
11. ***Formation of the male pronucleus;*** Within the cytoplasm of the oocyte, the nucleus of the sperm enlarges to form the male pronucleus and the tail of the sperm degenerates
12. ***The pronuclei fuse into a single diploid aggregation of chromosomes, the ootid becomes a zygote;*** The chromosomes in the zygote becomes arranged on a ***cleavage spindle*** in preparation for the cleavage of the zygote.
13. What is the difference between monozygotic twins & dizygotic twins

 Dizygotic are twins which result from the fertilization of 2 different eggs with 2 different sperms. Dizygotic twins pairs can be a girl/girl, boy/boy, or girl/boy. In other words for dizygotic twins are also fraternal or non-identical twins. They don’t look 100% alike.

 ***WHILE......***

 Monozygotic twins are twins which result from one egg & one sperm. The fertilized embryo then splits within days after fertilization resulting into two individuals which usually share the same chromosomes. In other words, monozygotic twina are identical twins & to look 100% alike.