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Embryology

200level

**1.Discuss Ovulation**

Ovulation is the process whereby an hormone triggers an ovary to release an egg. It is the release of an oocyte from the ovarian follicle.

The hormones that stimulate ovulation are produced in the pituitary gland; these are known as the follicle-stimulating hormone and luteinizing hormone. After the egg leaves the ovary, the walls of the follicle again close, and the space that was occupied by the egg begins to fill with new cells known as the corpus luteum. The corpus luteum secretes the female hormone progesterone, which helps to keep the uterine wall receptive to a fertilized egg. If the egg is not fertilized, the corpus luteum stops secreting progesterone about nine days after ovulation. If the egg becomes fertilized, progesterone continues to be secreted, first by the corpus luteum and then by the placenta, until the child is born.

As you approach ovulation, your body produces increasing amounts of a hormone called oestrogen , which causes the lining of your uterus to thicken and helps create a sperm friendly environment.

These high oestrogen levels trigger a sudden increase in another hormone called luteinising hormone (LH). The ‘LH’ surge causes the release of the mature egg from the ovary - this is ovulation.

Ovulation normally occurs 24 to 36 hours after the LH surge, which is why the LH surge is a good predictor of peak fertility.

The egg can only be fertilized for up to 24 hours after ovulation. If it isn’t fertilized the lining of the womb is shed (the egg is lost with it) and your period begins. This marks the start of the next menstrual cycle.

**Clinical Correlates**

Some women fail to ovulate, this is called an ovulation, because of low concentration of gonadotropins which can be treated with high and low success chances.

Pain is also common with ovulation/menstruation which is known as the middle pain.

**2.Differentiate between Meiosis I and Meiosis II**

Meiosis I

1. It is heterotypic or reduction division.

2. The chromosomes remain in the replicated state.

3. The number of chromosomes is reduced to half .That is, from diploid to haploid state.

4. Crossing over occurs which makes the two chromatids of a chromosome different.

5. It is complicated and long duration division.

6. An interphase having both growth phases and synthetic phase precedes meiosis I.

7. In prophase I, sister chromatids have convergent arms.

Meiosis II

1.It is homotypic or equational division.

2.The two chromatids of a replicated  chromosome separate.

3. The number of chromosomes remain the same, i.e., from haploid to haploid state.

4. The generally different chromatids of a chromosome are separated.

5. It is simple and short duration division.

6. The interphase or interkinesis has only growth phase. S phase is absent.

7. In prophase II, the sister chromatids have divergent arms.

**3.Discuss the stages involved in fertilization**

Passage of the sperm through the Corona radiate surrounding the zona pellucida of an oocyte.

* The dispersal of these follicular layers appears to result from the action of the enzyme Hyaluronidase released from the acrosome of the sperm, but the evidence for this is unequivocal.

Penetration of the zona pellucida surrounding the oocyte.

* This is an important phase in the fertilization of the oocyte
* The sperm forms a pathway through the zona pellucida which is believed to be as a result of the actions of the enzymes- esterases, acrosin neuroaminidase which cause causes lysis of the zona thereby forming a path for the sperm to follow the oocyte.
* Once the sperm penetrates the zona pellucida, a zona reaction occurs that prevents the other sperm from entering

Fusion of the plasma membranes of the oocyte and the sperm

* The fuse and break down at the area of fusion.
* The head and tail of the sperm enters the cytoplasm of the

oocyte, but the sperm plasma membrane remain behind.

Formation of Male Pronucleus

* Within the cytoplasm of the oocyte, the nucleus of the sperm enlarges to form the male pronuclues and the tail if the sperm degenerates.

Membrane of the pronuclei break down, the chromosomes condense and become arranged for mitosis cell division.

* The combination of 23 chromosomes in each pronucleus results in the formation of a zygote with 46 chromosomes.

**4.Differentiate between monozygotic twins and dizygotic twins**

* The difference between monozygotic and dizygotic twins is that in the former the twins develop from the same fertilized egg while in the latter the twins develop from two different fertilized eggs.
* Monozygotic twins have exactly the same genetic or hereditary material. Hence, they are called identical twins. On the contrary, the zygotic twins have difference in hereditary characteristics as ordinary brothers and sisters. Hence, they are called fraternal twins.