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Matric number: 18/mhs01/050

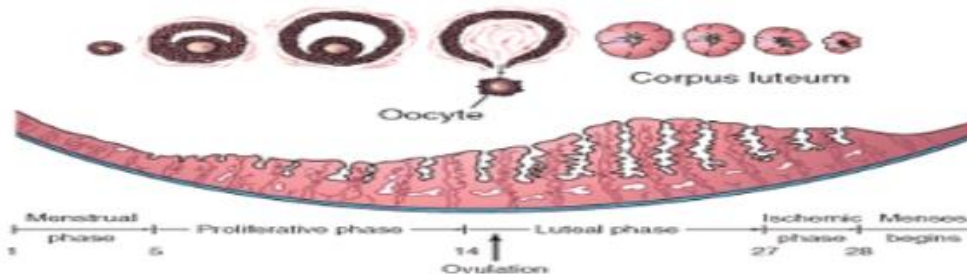
Department: Medicine and surgery

Level: 200 level

Course: Anatomy(Embryology)

1. Discuss Ovulation

Ovulation is the release of secondary oocyte from ovarian follicle. Before ovulation, Luteinizing hormone and Follicle stimulating hormone influences it and causes the follicle to grow to a mature secondary follicle. During final development of the secondary follicle there'll be increase in the release of LH which causes the primary oocyte to complete meiosis I and also causes the follicle to enter preovulatory state.



After completion of Meiosis I, meiosis II begins but the secondary oocyte is arrested at metaphase approximately 3 hours before ovulation. Meanwhile the surface of the ovary bulges locally and stigma appears at an avascular spot at the apex. There'll be increase in LH production caused by high estrogen level in the blood and increased collagenase activity in which there'll be digestion of collagen fibers. Then an increase in prostaglandin which causes contraction of the ovary that extrudes the oocyte. The release of this oocyte is ovulation.

Signs of ovulation

1. Tenderness of breast
2. Swollen vulva
3. Increased urge for sex

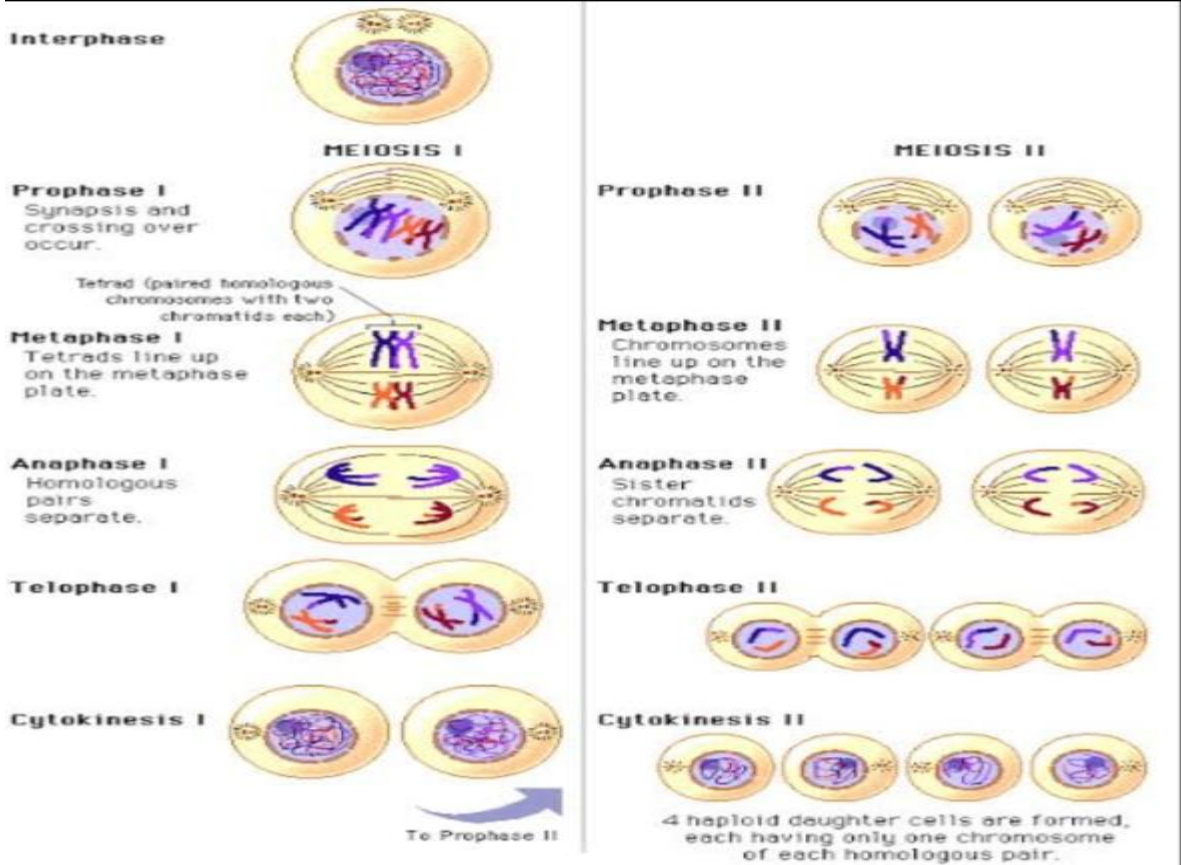
After ovulation some signs would be high temperature.

Inability to ovulate is called anovulation. This is due to low concentration of gonadotropin. So gonadotropin can be administered to them to ovulate but it could lead to multiple pregnancies.

2. Differences between meiosis I and meiosis II

Meiosis I Starts as diploid; ends as haploid	Meiosis II Starts as haploid; ends as haploid
Reductive division	Equational division
Homologous chromosome pairs separate	Sister chromatids separate
Crossing over happens	Crossing over does not happen
Complicated division process	Simple division process
Long duration	Short duration
Preceded by S-phase and G-phase	Preceded only by G-phase

Sister chromatids in prophase have convergent arms	Sister chromatids in prophase have divergent arms
Equatorial plane is centered	Equatorial plane is rotated 90°
Ends with 2 daughter cells	Ends with 4 daughter cells



3. Discussion the stages of fertilization

Fertilization is the union of the sperm and oocyte. It takes approximately 24 hours and takes place in the ampulla.

Stages of fertilization

1. Passage through the corona radiata: Here capacitation takes place which is the removal of glycoprotein coat and seminal plasma protein from the acrosomal region of the sperm in which acrosome is exposed. Then it passes through the corona radiata.

2. Penetration of the zona pellucida: Here the acrosome is fully involved. The acrosome binds with the receptor sites on the zona pellucida (in which after contact the permeability of oocyte changes) and releases acrosin, a lysosomal enzyme which breaks into the zona pellucida. When the sperm successfully breaks through the zona pellucida and enters the plasma membrane, the cortical granules will send a signal to the region of the zona pellucida to close their binding sites and this is the block to polyspermy.

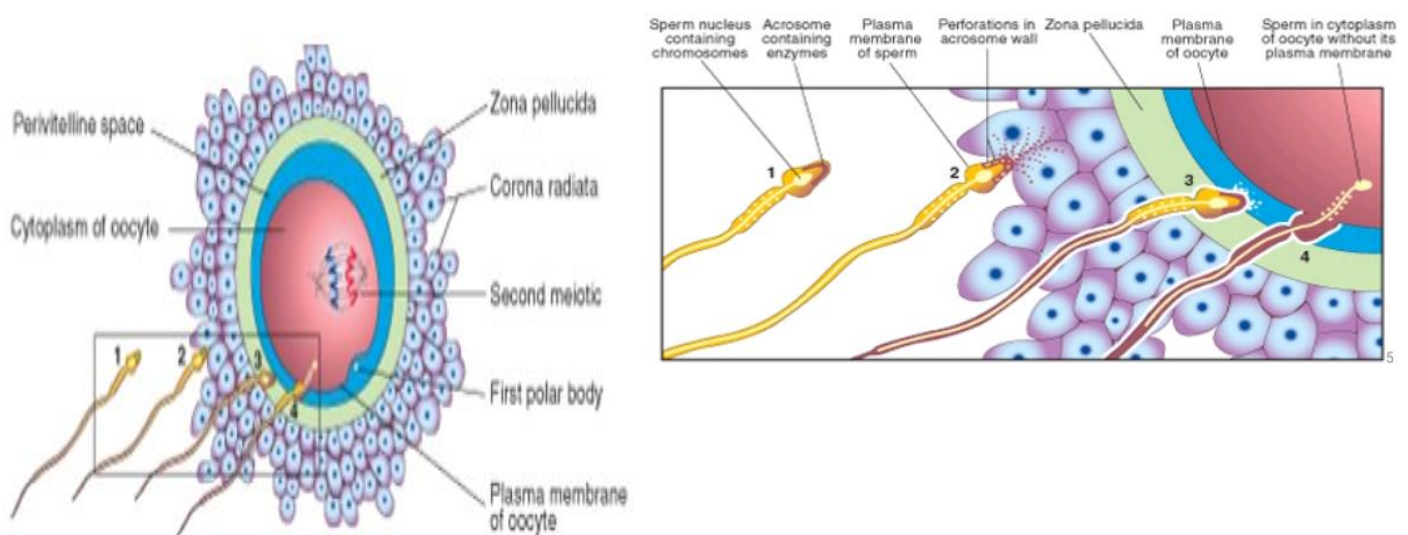
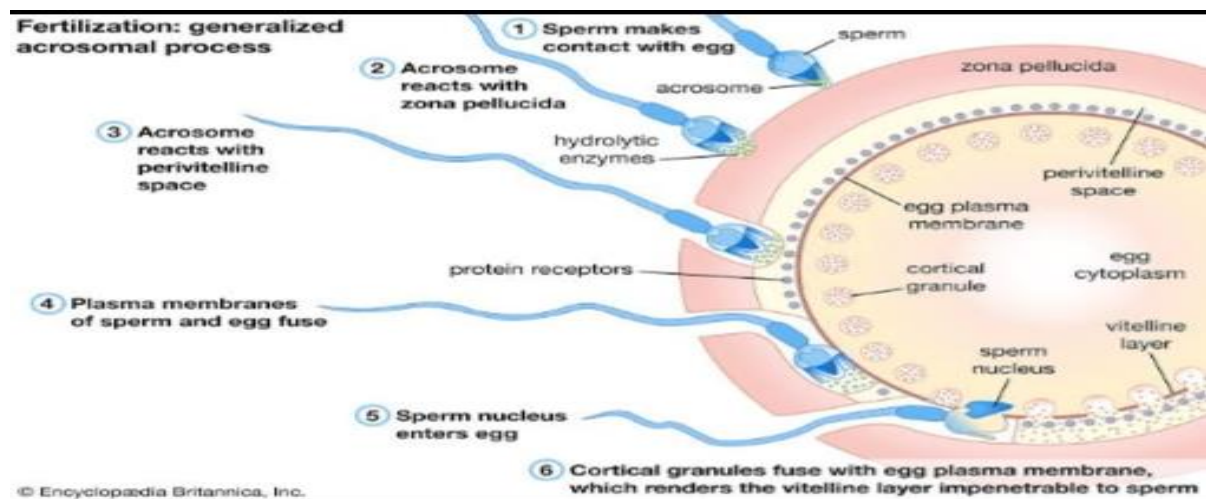
3. Fusion of the plasma membrane of the sperm and oocyte: The plasma membrane of the region of the tail of the sperm will not be allowed in as the head and tail of the sperm enters the cytoplasm of oocyte. The plasma membrane of the sperm left out will then fuse with the plasma membrane of the oocyte.

4. Completion of 2nd meiotic division and formation of the female pronucleus: As soon as the tail and head enters into the cytoplasm of oocyte, the 2nd meiotic division is completed forming a mature oocyte and polar body. The female nucleus becomes the female pronucleus.

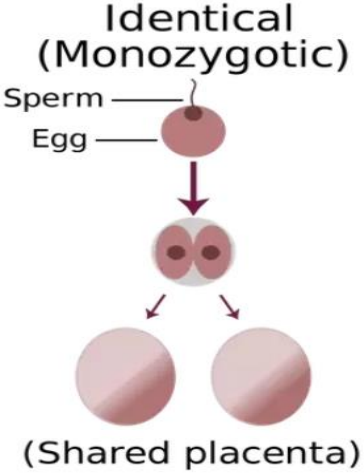
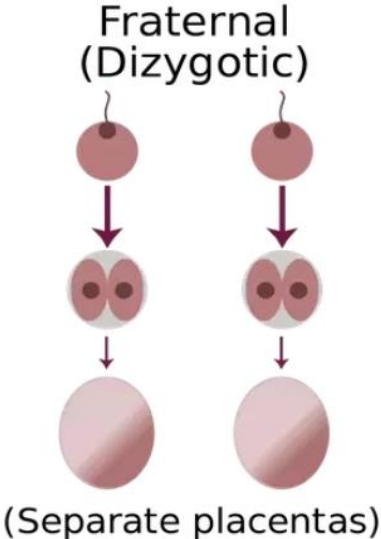
5. Formation of male pronucleus: The tail of the sperm degenerates while the male nucleus former will enlarge to form the male pronucleus. Its only the maternal origin that produces all the energy

needed within the zygote because the tails which contains the male's mitochondria has degenerated.

6. Formation of zygote: An Ootid which is an oocyte with two haploid pronuclei is formed. The Ootid will give rise to a zygote. Here the male pronucleus and female pronucleus with two haploid number of chromosomes each will fuse together to form zygote with a diploid number of chromosomes.



4. Differences between monozygotic twins and dizygotic twins

<p>Monozygotic twins</p> <p>Single ovum fertilized by single sperm to form embryo which splits into two embryos</p>	<p>Dizygotic twins</p> <p>They are developed by two different eggs fertilized by two different sperms</p>
<p>Placenta is usually one and shared</p>  <p style="text-align: center;">Identical (Monozygotic)</p> <p>Sperm ——— Egg ———</p> <p style="text-align: center;">(Shared placenta)</p>	<p>Has two separate placentas</p>  <p style="text-align: center;">Fraternal (Dizygotic)</p> <p style="text-align: center;">(Separate placentas)</p>
<p>Chorion is one or two</p>	<p>Chorion is usually two</p>
<p>Amnion is usually one or two</p>	<p>Amnion is usually two</p>

Physical appearance: Usually identical	Different
Blood types are the same	Blood types are different
Sex is the same	Sex is different or same