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1. Ovulation is produced by follicle stimulating hormone(FSH) and luteinizing hormone(LH). It is the 2nd change that occurs in the ovarian cycle. It takes place at the 2nd metric division. It is the release of a mature secondary oocyte from the ovarian follicle. After the oocyte is released, it travels down the fallopian tube, where fertilization by a sperm may occur.
   Ovulation occurs between the 11th and 21st day of the menstrual cycle
   In a few days before ovulation, under the influence of FSH and LH, the secondary follicle grows to a diameter of about 25mm to become mature vehicular follicle. Coincident with the final development of the vehicular follicle, there is an abrupt increase in LH that causes the primary oocyte to complete meiosis1 and the follicle to enter the pre ovulatory mature vesicular stage Meiosis2 is also initiated but the secondary oocyte is arrested at metaphase2 approximately 3hours before ovulation. In the meantime the surface of the ovary begins to bulge locally and at the apex, an vascular spot, the stigma appears. For the oocyte to be released, 2events must occur; a. It increases collagenase activity, resulting in digestion of collagen fibres surrounding the follicle b. Prostaglandin levels are increased due to LH surge and cause local muscular contractions in the ovarian wall. This causes ovulation in which oocyte floats out of the ovary. Ovulation is triggered by LH production.
2. In meiosis1, homologous chromosome separate while in meiosis2 sister chromatids separate
   In meiosis1 2 diploid daughter cells are produced while meosis2 produces 4haploid daughter cells
   In meiosis1 synapsis, crossing over and China formation occur while in meiosis2 they do not occur
   In meiosis1 the pliody level reduces from 4n to 2n while in meiosis2 the remaining set of chromosomes divide from 2n to n
   In meiosis1 centromere will not split while in meiosis2 centromere will split
3. There are 6 stages involved in fertilization which are:
   A. Passage of a sperm through the Corona radiata: The sperm must be capacitated which means removal of glycoprotein coat material and the semenal plasma protein from the

plasma membrane that overlies the acrosomal region of the spermatozoa. Only capacitated sperms can pass freely through the Corona radiata

B. Penetration of the zona pellucida: The zona is a glycoprotein shell surrounding the egg that facilitates and maintains sperm binding and induces acrosome reaction. The acrosome of a sperm binds with a zona glycoprotein on the zona pellucida. Release of acrosomal enzymes(acrosin) allows sperm to penetrate the zona pellucida thereby coming in contact with the plasma membrane of the oocyte. As soon as the head of the sperm comes in contact with the oocyte surface, the permeability of zona pellucida changes, the lysosomal enzymes are released from the cortical granules lining the plasma membrane to the oocyte
C. Fusion of plasma membrane of the sperm and oocyte: The plasma membrane of oocyte and sperm fuse and breakdown at the area of fusion. Plasma membrane of the head and tail will enter cytoplasm but every other part(plasma membrane of neck and tail that has fused with plasma membrane of oocyte) will be left behind
D. Completion of 2^{nd} meiotic division of oocyte and formation of female pronucleus: As soon as sperm enters region of oocyte the 2^{nd} meiotic division is completed I.e. as soon as head and tail of sperm enter cytoplasm 2^{nd} meiotic division is complete and forming a mature oocyte and 2^{nd} polar body. The female nucleus becomes the female pro nucleus.
E. Formation on Male pronucleus: Within the cytoplasm of oocyte, the tail degenerates while the Male nucleus of sperm enlarges to become pronucleus
F. Formation of zygote: The 2 pronuclei(the Male and female pronucleus) will undergo fusion and give birth to a structure called ootid, a single diploid aggregation of chromosomes which will develop into zygote. The chromosomes in the zygote become arranged on a cleavage spindle in preparation for cleavage of the zygote.

4. Monozygotic twins originate from fertilization of a single zygote or fertilised egg and a single sperm. The fertilised embryo then splits within days after fertilization resulting in 2individuals which normally share the same chromosomes. They are also known as identical or maternal or uniovular twins. Mostly they have very similar appearances. The type if placenta depends on the time of splitting of embryo. Their incidence in independent of race, age and parity while dizygotic twins are twins which result from 2 different eggs and 2 different sperms. Dizygotic twin pairs can be boy/boy, girl/girl or boy/girl. They are also called fraternal or non-identical or binovular twins. They usually don't look 100% alike and sometimes have appearances to each other in the same way non twin siblings have. There is presence of chorionic tissue between 2 amniotic sacs. Incidence is based on race, age, parity and ovulation inducing drugs.