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DEPARTMENT: MEDICINE AND SURGERY

COURSE CODE: ANA 205

COURSE TITLE: EMBRYOLOGY

1. DISCUSS OVULATION

Ovulation is the release of a mature secondary oocyte from the ovarian follicle. When the egg is released, it may or may not be fertilized by sperm.

However, the process of ovulation begins when your body releases Follicle- stimulating hormone (FSH) - approximately between day 6 and 14 of the menstrual cycle. This hormone helps the egg inside the ovary to mature waiting for its release. After maturing, your body releases luteinizing hormone to trigger the release of the egg which may happen approximately 28- 36 hours after LH SURGE.

Signs and symptoms of ovulation

* Tenderness of the breast
* Swollen vagina
* Increased sexual drive

Clinical correlates

1. Mittelschmerz or middle pain- abdominal pain which is near the middle of the menstrual cycle.
2. Anovulation- failure to ovulate
3. Multiple pregnancy- some drugs taken are effective and can thus produce multiple ovulations.
4. Differentiate between meiosis 1 and meiosis 2

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| **s/n** | **Meiosis 1** | **Meiosis 2** |
|  | Crossing over happens | Crossing over does not happen |
|  | Long duration | Short duration |
|  | Homologous chromosome pairs seperate | Sister chromatids seperate |
|  | Starts as diploid; ends as haploid | Starts as haploid; ends as haploid |
|  | Preceded by S-phase and G-phase | Preceded only by G-phase |

1. Discuss the stages involved in fertilization

Fertilization which is the first thing that happen in the very first week of human development occur under 6 stages.

1. Passage of sperm through the corona radiata: for sperm to pass through the corona radiata, capacitation and acrosomal reaction have to occur. Glycoprotein and seminar plasma protein have to be removed from the region of the head.
2. Penetration of the Zona pellucida: Acrosome releases an enzymes, Acrosine (lysosomal enzyme) which binds to the receptive site to the break the wall of the zona pellucida. The sperm now travel to the plasma membrane which has cortical granules present (it sends message to the Zona pellucida to close the binding sites to prevent POLYSPERMY.
3. Fusion of the plasma membrane of sperm and oocyte: the region of the head and tail of the sperm enters the cytoplasm leaving the plasma membrane of the sperm behind.
4. Completion of the second meiotic division and formation of female pronucleus: As soon as the head and tail of the sperm enters the region of the cytoplasm second meiotic division is completed. The female nucleus become the female pronucleus.
5. Formation of male pronucleus: The tail of the sperm will degenerate and the nucleus of the sperm will enlarge to form male pronucleus.
6. Formation of Zygote: The fusion of the male pronucleus and the female pronucleus give rise to Ootid and then further develop to Zygote.
7. Differentiate between monozygotic twins and dizygotic twins.

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| **s/n** | **MONOZYGOTIC TWINS** | **DIZYGOTIC TWINS** |
| 1. | They are developed by splitting of a fertilized embryo into two. | They are developed by two seperate simultaneous fertilization events. |
| 2. | Gender is the same | Gender is different |
| 3. | Cause is unknown | Caused either by IVF certain fertility drugs or hereditary predisposition |
| 4. | Blood types are the same | Blood types are different |
| 5. | Genetic codes are nearly identical | Genetic codes are same as any other siblings. |