Name:Olateju Ayobami khadijat

Mat no.: 18/MHS01/285

1. Discuss ovulation.

Ans: ovulation can be defined as a process whereby an oocyte is released from an ovarian follicle. For ovulation to occur, two hormones are usually involved and these are the: a, follicle stimulating hormone(FSH) b, liutinizing hormone.

For the oocyte to be released, 2 events occur which are caused by LH surge ad they include:

* digestion of collagen fibers (connective tissue) surrounding the follicle, by increasing collagenase activity.
* Prostaglandin levels also increase in response to the LH surge and cause local muscular contractions in the ovarian wall.

After this two events, Those contractions extrude the oocyte, which together with its surrounding follicular (granulosa) cells from the region of the cumulus oophorus. Extrusion of the oocyte will then cause ovulation, as the oocyte will flow out of the ovary.

1. Differentiate between meiosis 1 and meiosis 2.

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| Meiosis 1 | Meiosis 2 |
| Thiis results In division | This results In reduction |
| In prophase 1, there is synapse, crossing over and chiasma formation. | There is no synapse, crossing over and chiasma formation in prophase 1. |
| Centromeres do not split | Centromeres have splited. |
| There is formation of 2 daughter cells | There is formation of 4 daughter cells. |
|  |  |

1. Discuss the stages involved in fertilization.

Ans: fertilization can be defined as the union of sperm and oocyte to form a zygote and the stages involved include:

* **Passage of the sperm through the corona radiata:** for the sperm to be able to pass through the corona radiate, it has to be capacitated i.e the removal of the glycoprotein coat and the seminal proteins that overlies the plasma membrane of the acrosomal regional.
* **Penetration through the zona pellucida:** the sperm has to penetrate the zona pellucida and the zona pellucida is the glycoprotein coat that surrounds the oocyte and facilitates acrosome reaction. The acrosome of the sperm will bind with the zona glycoprotein of the zona pellucida, and this will facilities the release of acrosin which will allow easy permeability of the oocyte plasma membrane, when the sperm head comes in contact with the plasma membrane, the oocyte will then release lysosomal ezymes from the cortical granules lining the plasma membrane of the oocyte.
* **Fusion of plasma membrane of sperm and oocyte:** the plasma membrane of the sperm and the oocyte will fuse together. The head and tail of the sperm will enter into the plasma membrane leaving the plasma membrane behind.
* **Completion of meiosis 2 and formation of the female pronucleaus:** the fusion of the plasma membrane will prompt the completion of meiosis 2 and and there will be the formation of the secondary oocyte and a second polar body and the mature oocyte the become the second pronucluei.
* **Formation of the male pronucleaus:** In the cytoplasm of the oocyte, the nucleaus found in the head of the sperm will enlarge and become the male pronucleaus leaving the tail behind.
* **Fusion of the 2 pronuclei to form a diploid cell:** the 2 pronuclei (ootid) will fuse together to form a zygote(diploid cell), they will then arrange on a cleavage spindle in preparation for cleavage.
1. Differentiate between monozygotic and dizygotic twins.

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| Monozygotic twins | Dizygotic twins. |
| Fertilization of one secondary oocyte by one sperm |  Fertilization of two oocyte by two different sperm. |
| They are of the same sex. | They can be of different sex or the same sex. |
| They have one blastocyst which the inner cell mass divides into 2 | They have 2 different blastocyst. |
| They are genetically identical | They are not genetically identical. |
| They have just one placenta | They have two separate placentas |
| They happen more often | They are less common. |

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