The Female Reproductive/Ovarian/Uterine Cycle

The beginning of the menstrual cycle is easily definable and is therefore set by convention as the beginning of the monthly female sexual cycle. The cycle is typically 28 days but many vary normally within a range of 25-35 days.

During the first few days of the sexual cycle, secretions of both FSH and LH, by the anterior pituitary gland, increase slightly to moderately. Follicle-stimulating hormone, as the name suggests, is slightly more elevated during this stage of follicle development. As a result, 6-12 primary follicles accelerate their growth.

The early proliferative phase of growth, lasting for a few days, is driven by FSH alone. As the follicle grows, estrogen is formed and further enhances sensitivity to FSH. Estrogen levels begin to rise resulting in rapid expansion of the antrum.

About 2 days before ovulation, LH levels increase rapidly. As the name suggests, LH hormone begins to predominate as luteination begins though FSH levels also continue to rise. The LH stimulates granulosa cells to produce progesterone, as a prolonged phase of excessive estrogen release declines.

As LH levels spike, follicular capsule cells begin to release lysosome to weaken the wall of the ovary. Local prostaglandins cause rapid swelling of the follicle. In combination, these two effects result in the follicle rupturing through the wall of the ovary. This main cause a twinge of pain called mittelsmirtz.

Secretion of progesterone during the latter half of the cycle raises the body temperature about 0.5°F, with the temperature rise coming abruptly at the time of ovulation.

In the first hours after ovulation, the remaining follicle changes significantly. The cells enlarge and begin to be filled with lipid, causing a yellowish appearance (lipid is a precursor for estrogen and progesterone). The mass of cells is called the corpus luteum.

The cells of the corpus luteum begin to secrete large amounts of progesterone and estrogen. These hormones feed back to the anterior pituitary reducing the release of LH and FSH. LH and FSH levels remain low while estrogen and progesterone levels are elevated.

Low blood concentrations of both LH and FSH cause the corpus luteum to degenerate, reaching completion at day 26 of the cycle. This degeneration causes a cessation of estrogen and progesterone, releasing their inhibition of the anterior pituitary’s release of FSH and LH. The release of FSH and LH initiate the growth of new follicles, beginning the ovarian cycle anew. The loss of estrogen and progesterone also serve to signal the uterus to shed its endometrium.

After a week or more of growth but before ovulation occurs—one of the follicles begins to outgrow all the others; the remaining 5 to 11 developing follicles involute. It is thought that once a follicle can secrete sufficient estrogen, this estrogen provides positive feedback effects to that follicle while providing negative feedback to FSH. Without FSH to sustain their growth, the remaining follicles cease developing.

The Male Reproductive Cycle

- GnRH stimulates pituitary to release FSH and LH
- FSH stimulates Sertoli Cells to produce ABP (Androgen binding protein)
- LH stimulates Leydig cells to produce testosterone
- Testosterone promotes sperm development from spermatogonia

Yes, it is that simple (okay, for the most part it is that simple)