The Female Monthly Cycle

For many women, their cycle likely only crosses their mind once a month – just as their period is about to start. However, their period is just a small part of the entirety of the menstrual cycle, which encompasses numerous hormonal fluctuations and physiological changes throughout the month. These changes not only affect functions occurring within the body, but can also significantly impact mood, energy levels, and overall well-being.

Understanding the biology of the monthly cycle is the first step to working with it. By staying attuned to the body's cues throughout the month, one can proactively address its evolving needs not just during menstruation, but every day!

Hormones play an important role in controlling many functions throughout the body

The key to understanding the biology of the menstrual cycle starts with getting to know the main players – hormones.

Hormones are specialized chemicals produced by the body to regulate the activity of specific cells. By circulating through the bloodstream, hormones influence nearly every part of the body and control many important functions like digestion, energy levels, skin condition, and cognitive abilities.

Sex hormones are a class of hormones that play essential roles in the development and regulation of sexual characteristics and reproductive functions throughout life. During fetal development, these hormones help develop reproductive organs. Once puberty hits, they trigger physical changes such as growth spurts, vocal changes, and the onset of menstruation or sperm production. In adulthood, sex hormones continue to play a major role in controlling reproductive functions, sexual desire, and overall sexual well-being.

While both males and females produce all sex hormones, variations in hormone levels dictate the development and function of male and female bodies differently. In males, the primary hormone is **testosterone**; in females, **estrogen** and **progesterone** are the main sex hormones.

Male and female hormones follow unique rhythms

Hormonal fluctuations also vary between males and females. In males, testosterone levels cycle throughout the day in sync with the body's natural circadian rhythm. Levels peak in the morning and decrease gradually, reaching their lowest point at night. In females, estrogen and progesterone undergo monthly cycles of fluctuation. These hormones, along with **follicle-stimulating hormone (FSH)** and **luteinizing hormone (LH)**, are the four critical regulators of the menstrual cycle.[1]

Like all other hormones, sex hormones can impact various organs in the body. Beyond their primary roles, these hormones can influence mood, energy levels, bone density, and gut function – all of which sync up to the different stages of the menstrual cycle.

Changes in sex hormones orchestrate the menstrual cycle

Each month, the menstrual cycle prepares the female body for the possibility of pregnancy through two main processes. First, a single egg matures, ready to join with sperm for fertilization. If fertilized, the egg will eventually develop into an embryo. However, if not fertilized, the egg disintegrates or is absorbed by the body. Second, the walls of the **uterus** thicken to facilitate the comfortable attachment of a fertilized egg. Should fertilization not occur, the newly thickened lining will be shed during menstruation. These events typically span 25 to 35 days, after which the cycle begins again.

The entire menstrual cycle, driven by changes in the four key sex hormones, can be further broken down into four stages: The follicular stage, the ovulatory stage, the luteal stage, and the menstrual stage.

Stage 1 – Follicular Phase

*During the follicular stage, an egg matures within the almond-sized **ovaries**. This stage lasts approximately 14 days but varies widely.*

Ovaries contain tiny sacs called **follicles**, each cradling an immature egg surrounded by an outer layer of nurturing cells supporting their growth. A rise in **follicle-stimulating hormone (FSH)** levels kickstarts this stage, prompting several follicles to start maturing. While multiple follicles begin to develop, typically only one becomes fully mature in each cycle. The fastest-maturing follicle emerges as the “dominant” one, releasing estrogen which acts as an off-switch for FSH production. Without FSH, the other follicles cease development and are eventually reabsorbed by the body.

Stage 2 – Ovulatory Phase

*During ovulation, the mature egg is released from the ovarian follicle and enters the **fallopian tube**, ready to be fertilized by sperm. This stage typically lasts for around 24 hours.*

Following the follicular stage, estrogen levels continue to climb, stimulating the release of **luteinizing hormone (LH)**. Within about 36 hours, LH levels peak, initiating ovulation. During ovulation, the dominant follicle ruptures, freeing the mature egg. It then travels down the fallopian tube, a slender, muscular passage connecting the ovaries to the uterus, where it could potentially meet and be fertilized by sperm.

While the ovulation stage is brief, the window of opportunity to become pregnant lasts around 6 days. This is because sperm can survive in the female reproductive tract for several days, awaiting the release of the egg.

Rising estrogen levels during the follicular and ovulation stages influence several physiological processes. For instance, estrogen boosts the levels of a brain chemical called serotonin, which improves mood and energy levels.

Stage 3 – Luteal Phase

During this 14-day stage, the ovary releases hormones to prepare the uterus for potential pregnancy.

After ovulation, the ruptured follicle left behind in the ovary assembles into a temporary structure known as the **corpus luteum**. The primary function of the corpus luteum is to release hormones like progesterone, which thicken the walls of the uterus, creating a hospitable environment for a potential fertilized egg. If fertilization occurs, the egg attaches itself to the wall of the uterus. However, if fertilization does not occur, the egg and the corpus luteum eventually dissolve.

During the luteal stage, many women experience a combination of symptoms commonly referred to as premenstrual syndrome or PMS. While the precise causes of PMS are unclear, it is believed that the large fluctuations in hormonal levels at this stage result in fatigue, bloating, constipation, breast tenderness, and mood changes.

Stage 4 – Menstruation Phase

Menstruation occurs when the lining of the uterus is shed through the vagina. This stage typically lasts anywhere between 3 to 5 days.

Once the corpus luteum breaks down and progesterone levels decrease, the thickened lining of the uterus starts shedding through the vagina. This lining contains blood vessels and tissue debris, creating a mixture of blood and tissue in the menstrual flow. This combination gives menstrual blood its distinct thicker and darker appearance compared to regular blood.

During this time, levels of a chemical called prostaglandin rise. Prostaglandin helps the uterus to contract and shed the lining, resulting in menstrual cramps for some women. The drop in progesterone levels also signals the start of a new menstrual cycle by stimulating the release of FSH, and triggering the maturation of a new set of follicles.

Nurture your body every day of your menstrual cycle

By understanding the complex biological changes your body experiences throughout your cycle, you can begin to learn how to care for your body effectively.

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