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Undergraduate



# The Menstrual Conundrum

BY: SANIA MOGHE

The average Western woman will have around 451 periods in her lifetime. This means that each woman will spend approximately 34 years of her life menstruating, according to a study conducted by the European Investigation into Cancer and Nutrition.<sup>1</sup> Although menstruation is a natural and ubiquitous process, many women and girls are left in the dark about the specific function that menstruation serves. In fact, 98% of mammalian species do not menstruate at all, meaning periods in humans seem like quite a biological anomaly.<sup>2</sup> However, recent research has shown that periods actually play a critical role in both protecting and preserving a woman's body and resources. To explore the adaptive benefits of periods, it is important to first understand the foundations of the female reproductive cycles.

## A Brief Breakdown of the Uterine Cycle

The innermost lining of the uterus is called the endometrium. In the event of pregnancy, the endometrium is necessary for providing a burrow for the embryo to implant, supplying oxygen and nutrients to the embryo, and offering protection against microbial invasion.<sup>3</sup>

In general, the human uterine cycle consists of cyclical building and shedding of the endometrium, and is broken down into three main phases: first, the proliferative (or follicular) phase, followed by the secretory (or luteal) phase, and finally menstruation.

During the proliferative phase, endometrial cells divide and multiply, forming the blood vessel-rich endometrium. Then, during the secretory phase, the endometrial lining reaches maximum thickness and prepares for potential fertilization. This coincides with ovulation, which is the release of an egg from the ovary

towards the uterus. Both this ovarian cycle and the uterine cycle (together called the menstrual cycle) are linked together through regulation by sex hormones. If the egg is not fertilized by sperm, the endometrium starts to shed out of the female body in a process called menstruation.

### The Cost Efficiency of a Cycle

Given the meticulous process of periods, a question arises: why are they cyclical? In other words, why do we have to rebuild our lining at the start of each cycle instead of having a perpetually present endometrium (also known as a secretory endometrium)?

Perhaps this could be attributed to a matter of resource-efficiency—it might be more effective to maintain uterine lining cyclically as opposed to indefinitely. Throughout the menstrual cycle, the endometrium thickens until the point of ovulation, and then regresses to its prior state. According to writers Drs. Richard Jones and Kristan Lopez of the Human Reproductive Biology textbook, “the fully grown endometrium uses about seven times as much oxygen as in a regressed state,” meaning it takes a significantly higher amount of energy to maintain a thickened secretory endometrium.<sup>4</sup>

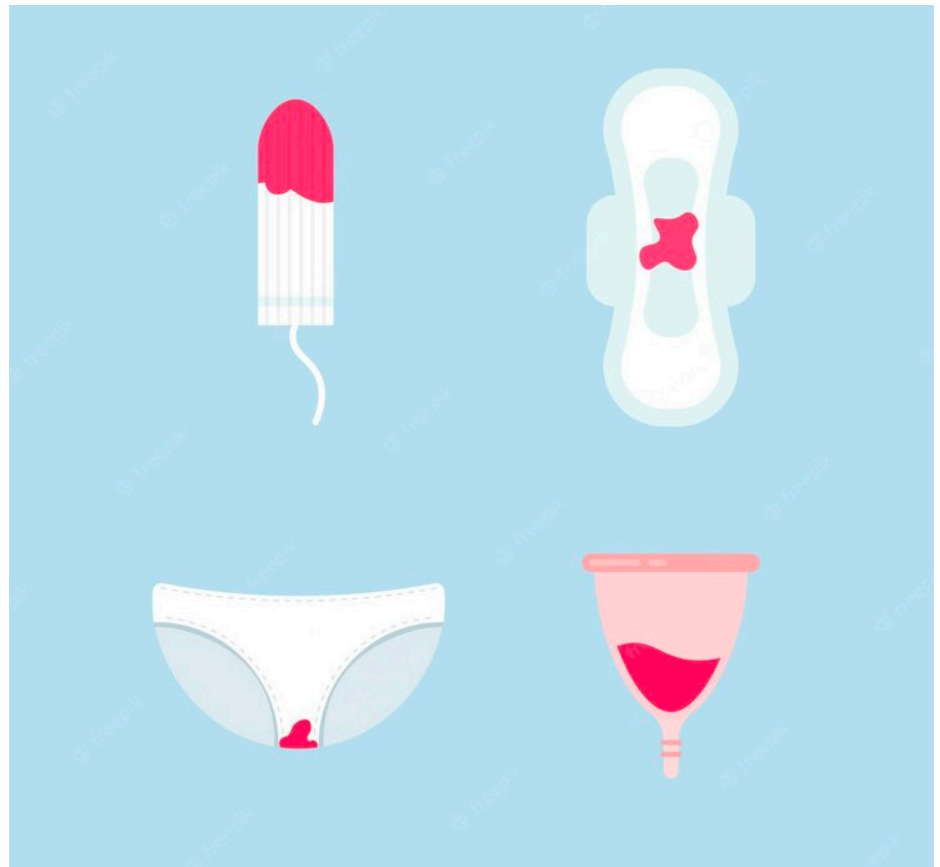
Additionally, maintaining a constant secretory endometrium could also lead to abnormal endometrial overgrowth or

endometrial cancer. This is because estradiol and progesterone, two sex hormones that stimulate and maintain endometrial growth during secretion, greatly increases the rate of cell division in the uterus. As the rate of cell division increases, so does the risk of cancer-causing mutations.<sup>5</sup> Thus, having endometrial tissue that only multiplies when necessary might serve as an effective measure to combat unregulated cell growth.

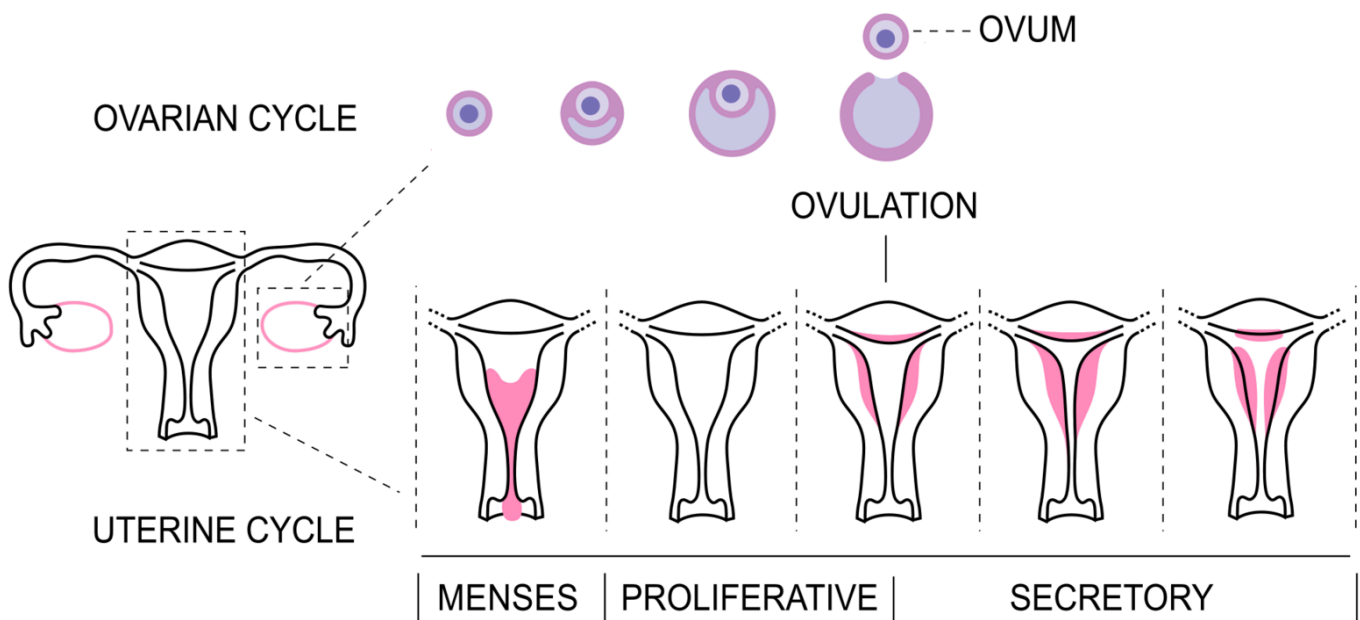
**So Why Do Humans Bleed (and not most other mammals)?**

Half of the story has now become clear. The process of endometrial shedding is cyclical for resource-efficiency. However, another question arises: why do humans bleed? While other mammals reabsorb endometrial tissue back into their body, humans shed this tissue – along with other vaginal secretions and blood – out of the body. According to the University of Edinburgh’s HOPE report, with the exception of humans, old-world primates, elephants, and a few other animals, “all other animals reabsorb their endometrium if pregnancy does not occur”.<sup>6</sup> Thus, although the process of bleeding seems like an inconvenient alternative to reabsorption, there might actually be multiple evolutionary advantages to menstruation.

For one, fertilized human embryos embed deeply into the endometrial tissues



**Figure #2: Bleeding due to menstruation is a phenomenon unique to only a few mammals, including humans.** Menstrual products, such as tampons, period pads, absorbent underwear, and menstrual cups, make monthly bleeding more manageable for women.



**Figure #1: The ovarian cycle (top) works in conjunction with the uterine cycle (bottom).** As ovulation occurs, the endometrium thickens to its maximum capacity. In the event that fertilization does not occur, the endometrium sheds via menstruation and the cycle starts again.

of the uterus during pregnancy. In contrast, many other mammals' embryos embed only superficially into the endometrium. The unusual depth at which human embryos embed warrants an exceptionally thick endometrium. However, this means the volume of endometrial tissue is too high to be reabsorbed back into the body; thus, the surplus of tissue must be removed through menstruation.

In addition, researchers believe that menstruation can provide a defense

mechanism against faulty embryos. Perhaps the endometrium can sense any unwanted or tainted embryos, such as one that fails to properly implant in the uterine wall, and jettisons them out of the body through menstruation. This would prevent the mother from expending valuable resources on an unviable embryo. According to mammalian specialists Drs. Andrew Blanks and Jan Brosens, around 30-60% of faulty human embryos are discarded through menstruation.<sup>8</sup>

Tying these concepts together, many other mammals that require deep embryonic implantation exhibit embryo-driven endometrial decidualization. This means that the endometrium will only thicken if it senses a viable embryo. Humans are one of few species whose endometrial decidualization does not require embryonic implantation, meaning humans will perpetually have excess endometrial tissue in the absence of pregnancy.<sup>7</sup> This seems to be another safeguard from faulty fetuses: instead of immediately preparing for pregnancy upon implantation, the female body will vet the fetus first to make sure it is healthy and viable.

Human menstruation is a cyclically-driven process that poses several advantages; this includes reducing the risk of cancer, providing a means to rid the body of excess tissue, and enabling the ejection of unviable fetuses. Given these benefits, periods serve an extremely important function in both protecting the female body and promoting smooth pregnancies.

Despite these benefits, however, there is a universal stigma surrounding menstruation and women's health education in general. Historically and in many cultures today, periods are seen as a "shameful" or "gross" process that women should avoid sharing with others. Menstruation is wrongly viewed as a deficit even though it is vital to the female body.

There are a couple of reasons for why this "period stigma" is continuously propagated. For one, the vast majority of individuals are unaware of menstruation's purposes because period research and education are severely lacking. This is in part due to persistent androcentric biases in modern health research.

Androcentrism is the emphasis of male-centered narratives within universal human issues – for example, since periods are not a male phenomenon, medical research has historically pushed menstrual questions to the margins. Many scientists have habitually assumed that research centered around the male-worldview can be applied to females (but not the other way around). Thus, researchers tend to ignore the distinct anatomies and processes of female bodies, deeming them extraneous. In fact, it was not until 2016 that the National Institutes of Health (NIH) mandated the Sex as a Biological Variable (SABV) policy, which recognizes sex as an important variable to consider when designing and interpreting studies.<sup>9</sup> Before this act, scientific studies were mainly based on research garnered



**Figure #3: A woman in Bali standing next to a sign that reads “ATTENTION: It’s Prohibited To Enter Without Decent Dress And For Woman Having Menstruation. Thank You,” showing the ubiquitous stigma surrounding periods.**

from male test subjects, thus ignoring how experimental designs could uniquely impact females, given their distinct hormonal cycles. Research centered around female bodies were – and still are – seen as unnecessary.

Although modern research is slowly starting to include facets of the female-worldview, formalized education systems are needed to connect this research to ordinary individuals. In order to debunk misrepresentations surrounding menstruation, it is imperative to talk openly, objectively, and educatively about the nature of periods. Put simply, learning about periods is a privilege for many women and girls around the world. Perhaps we should reflect on why education about a natural phenomenon affecting over 1.8 billion people on a monthly basis is a privilege in the first place.

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