

## Menstrual Cycle and its Importance

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### Abstract

*The period of menstrual cycle lies in between menarche to menopause in woman's life. This is the golden period; during this period a woman can produce babies naturally. Because of this, during this period sex steroids play a major role in regulating physiological processes in females. Recent researches have shown the brain functioning during this time is at the peak. Further, pregnancy, during this period teaches the woman skills concerning child care. Because of steroid hormone actions ophthalmic adjustments also takes place. Pregnancy blood has become major source in cell therapies for mesenchymal cell disorders.*

### INTRODUCTION

The 28 days cycle (25 to 30 days) in human females commences from menarche and ceases with menopause with the intermittent pauses during pregnancies. The menstrual cycle may be divided into two phases: (A) follicular or proliferative phase, and (B) the luteal or secretory phase. The follicular phase begins from the first day of menses until ovulation. After the ovulation the left over scar known as 'corpus leutum' produces progesterone. The period between menarche to menopause can be designated as "child bearing age" of a woman (1). Menarche is the essential event for motherhood (2). Menarche and menopause is the play of sex steroids which are mainly secreted by the ovary. The ovaries produce and release two groups of sex hormones - progesterone and estrogen. These two works together to assist in the balanced development of a woman's sex characteristics. Their prime role is to maintain the menstrual cycle. Estrogen sending messages to the uterus to grow and replace the lining that was shed in the previous cycle where as progesterone's role is to signal the beginning of menstruation. If a woman's egg is fertilized during her cycle, progesterone levels remain high in order to stimulate glands that provide nutrients to the embryo (1). The third sex steroid hormone testosterone is also produced by the ovaries has little role to play menstrual cycle. However, Its main function is to regulate a woman's sex drive. It

also helps women preserve muscle mass and supports an overall sense of wellbeing. The combination of testosterone and estrogen can increase a woman's libido considerably during ovulation and even menstruation (3)

### Sexual Dimorphism

Sexual dimorphism is the systematic difference in form between individuals of different sex in the same species. Human male and female appearances are perceived as different, although Homo sapiens has a low level of sexual dimorphism compared with many other species differences between females and males are numerous. The degree of sexual dimorphism in a species is the result of the difference between the sum of all the selective pressures (natural selection and sexual selection) affecting the male and the sum of those affecting the female. In humans, signs of sexual interest aren't nearly so obvious. The male of the species generally doesn't broadcast his constant readiness for sex, and during her window of fertility at ovulation, the female doesn't display any outward signs.

Evolution of Sexual Dimorphism: Sexual dimorphism has fascinated mankind since before the time of Darwin. Darwin (natural selection) gave the scientific angle to this phenomenon, however, recent reviews have both questioned the very notion of sexual selection (4 ). Ancient Indian scripture Kamsutra (5, 6), gave a logical description

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of sexual dimorphism. He even subclassified human females (5). In addition to reproductive organs sexual dimorphism exist at other organ level, *e.g.* eye (7) and system *e.g.* Immune system where females show stronger immune system than man(8).

### Aging Effects on the Cycle

Menarcheal age: Menarche is a signal when girls enter puberty. Accurate estimate on the age of menarche is very difficult since, sexual maturity is influenced by a wide variety of factors such as geographical connotations, socioeconomic status, diet, exercise, environment, religion, genetic and hereditary factors, ethnicity, psychological stress, migration and chronic illnesses with opinions both supporting and rejecting it (9). Age of menarche has been observed to reduce in many parts of the world during the early part of the 20th century at the rate of approximately four months per decade till it stabilized at around 13 years (10-12). Even the rate of reduction per decade has been calculated from few studies for example; English girls had menarche at an average rate of 4 months lower per decade (13) and 2.6 months per decade in Hungary (14). Some estimates suggest that the median age of menarche worldwide is 14, and there is a later onset of menarche in Asian populations compared to the West (15).

### Child Bearing Age: High Time for Change

Researchers at McGill University in Montreal showed that moving adolescent rats into “enriched” environments — larger cages with more toys and cagemates — could reset stress responses that had been thrown out of whack by early-life trauma.

Romeo was studying rats to see if stress affects adolescent and adult brains differently. In one set of experiments, he subjected adult rats and prepubescent rats to acute stress — 30 minutes trapped inside a wire mesh container — and recorded their levels of corticosterone (the rat version of cortisol) before, during and after the confinement. Both groups produced similar hormone spikes when stressed, but in the juvenile rats, levels took much longer to return to normal (16,17).

These findings heartened Gunnar. “Maybe I should be looking at puberty,” she thought. It could be a time to recalibrate. As Gunnar and others have shown, impaired stress responses can return to normal during puberty, raising the possibility that imbalances created

by early trauma can be erased (18). The research is prompting a new view of puberty as an opportunity — a chance for people who had a shaky start to reset their physiological responses to stress.

Though child bearing age is from menarche to menopause, the “biologically optimal” time for childbearing is in between 20 to 35. Beyond 35, the risks to the health of mother and baby including high blood pressure, diabetes and foetal abnormality rise. As the average age of motherhood has risen, so has the rate of complications and abnormalities. In fact, female’s ability to conceive and give birth to live offspring – starts to decline before the age of 30, and the rate accelerates after about age 35 (19,20). This decline is due to a continuous and immutable decrease in both the quantity and quality of eggs with increasing female age. Although the rate of egg decline varies among women, it is universally experienced and nothing, yet, can be done to slow its progress.

During pregnancy, the cycle stops and restarts about six to eight weeks after the birth of the child. Normally periods will typically return, if you aren’t breastfeeding. If you do breastfeed, the timing for a period to return can vary. Those who practice exclusive breastfeeding might not have a period the entire time they breastfeed. It is common for a woman’s period to change after having a baby. Some women experience heavier or more painful periods, while others find that their periods become easier. In the months after giving birth, periods may be irregular but may return to normal over time.

Ayurveda divides human life into—childhood (up to the age 16 years); (vivardhamana, 16–20 years of age), youth (youvana, 20–30 years), maturity (sampoornata, 30–40 years), deterioration (parihani, 40 years onwards) which gradually sets in up to 60 years]; and each phase of life some organs slow down their functioning. For example thymus attenuates in the first phase of life. Thereby our growth stops ( 21). Similarly ovary stops working around 45/50years. (19,20). Organs at old age ( 60–70 years) the body elements, sense organs, strength, and so forth begin to decay (22).

### Menstrual Blood

Menstrual blood-derived mesenchymal stem cells (MenSCs) Menstrual blood-derived mesenchymal stem cells (MenSCs) are boon in therapeutics and

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a list of diseases is treated and more are in pipeline undergoing clinical trials. Approximately a decade ago, Meng et al. (23) and Cui et al. (24) discovered a novel source of MSCs from human menstrual fluid, named menstrual blood derived stem cells (MenSCs) (25). These MenSC have high rate of proliferation and possess multi lineage differentiation potency as well as its differentiation into epidermal lineage is remarkable (26).

### Menopause: No More Menstrual Cycles

Menopause is a natural stage in a woman's life. It occurs in middle age when the body stops ovulating, which stops having monthly menstrual cycles. This shift occurs because of the change of hormones in woman's body (1,2).

Menopause is considered to be a three-stage process: **A.** Perimenopause refers to the 8-10 years before menopause when the ovaries slowly produce less estrogen. **B.** Menopause refers to the time when the menstrual periods have stopped for at least a year. **C.** Postmenopause is the stage of life after a woman has not had a period for 12 months or longer. The risks of certain conditions like osteoporosis and cardiovascular diseases rise after menopause. Therefore, it's important to develop healthy lifestyle habits before and after menopause. Lifelong attention to calcium, exercise, and a healthy lifestyle reduce the risks of menopause.

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