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## Understanding Menstruation and Infections: A Comprehensive Review

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### Abstract:

The menstruation is regarded as a normal biological activity, although at times it may be linked with infections caused by hormonal shifts, hygiene, and many more aspects. Infections that are commonly precipitated by menstruation include bacterial vaginosis, yeast infection, urinary infection, and toxic shock syndrome. Understanding each infection's etiology, symptomatology, and treatment is important. Proper menstruation hygiene, the right type of menstrual products, and preventive action can help mitigate the risk of developing infections. This article focuses on the different stages of the menstrual cycle, ranges of infections that menstruation is a factor in, how to prevent them, and the right time to seek medical attention concerning menstruation to protect one's reproductive health.

**Keywords:** Menstruation, Menstrual Cycles, Periods, Infections, Bacterial Vaginosis.

### Introduction

Menstruation, also known more commonly as a period, is a natural biological function that happens to people with a uterus and is a part of the reproductive cycle (1). It comprises the monthly shedding of the uterine lining and is controlled by hormonal shifts. While menstruation itself is normal and necessary, it results in certain physiological changes that can sometimes cause infections. Hormonal changes, unsatisfactory menstrual hygiene, infrequent replacement of certain menstrual products, and preexisting health conditions are some factors that increase the risk of infections during this phase. Without treatment, these infections range from mild discomfort to serious reproductive health complications (2). Therefore, knowledge of the different types of menstrual-related infections, their causes and symptoms, and prevention strategies is essential to ensure associated reproductive and menstrual health is optimal. Individuals can greatly reduce the chances of infections and their general health during the menstrual period by observing good hygiene practices and being on alert for possible dangers.

### The Menstrual Cycle: An Overview

The menstrual cycle comes as a natural repeating process that prepares a woman's body for a possible pregnancy (3). This cycle takes from 21 to 35 days to complete, although the average is 28 days. The cycle consists of four stages, some of which are most important in achieving optimal reproductive health.

#### 1. Menstrual Phase (Days 1-5)

The first stage of the menstrual cycle is termed the menstrual phase, which can range from three to five days but can be longer for some individuals. During this stage, a woman experiences menstrual bleeding or shedding of the uterine lining (endometrium) found in the uterus caused by the dip in estrogen and progesterone hormones (4). The body is aware that pregnancy did not take place. The amount of blood loss during this stage is approximately 30 to 80 milliliters, with some women shedding a greater amount of blood than others. People suffering from cramping, fatigue, and mood swings experience these symptoms during this phase of the cycle because the uterus contracts to facilitate the functioning of the lining.

#### 2. Follicular Phase (Days 1-13)

The follicular phase starts with Day 1 of menstruation and overlaps with the menstrual phase, ending at ovulation which occurs around day 13. The pituitary gland in the brain releases follicle stimulating hormone (FSH) which helps in the growth of ovarian follicles, tiny fluid filled sacs in the ovaries that contain immature eggs (5). During this time, estrogen levels elevate, resulting in the thickening of the uterine lining in case of a possible pregnancy. This phase ends once the dominant follicle is ready to release an egg.

#### 3. Ovulation Phase (Day 14)

If one follows a 28-day cycle, ovulation is usually around day 14 and it is the shortest but the most critical part of the cycle. During ovulation, the dominant follicle releases a mature egg from the ovary into the fallopian tube, ready to be fertilized by sperm (6). This

is initiated by a spike in luteinizing hormone (LH) 24 - 36 hours before one ovulates. A few people have very mild signs of symptoms during ovulation, like an increase in body temp, a slight amount of pelvic pain, or increase in mucus in the cervix - which gets clearer and stretchier to facilitate the joins movement. The egg is capable of being fertilized and stays that way for about half a day to a day; if it is not fertilized, it begins to break down.

#### **4. Luteal Phase (Days 15-28)**

The luteal phase begins at ovulation and ends about fourteen days later. Following ovulation, the follicle that released the ovum changes into a temporary gland called the corpus luteum. The corpus luteum discharges progesterone and estrogen, which make sure that the thickened tissues in the uterus are nurtured in preparation for possible implantation (7). If fertilization does happen, the value embryo gives off a substance, human chorionic gonadotropin (hCG), that makes the body carry on producing progesterone in order to have the pregnancy maintained. If there is no fertilization, the corpus luteum slowly degenerates, resulting in a drop of progesterone and estrogen. The lack of these hormones leads to the demolition of the uterine lining, which marks a new cycle. During menstruation, the vaginal environment changes due to shifts in pH levels and hormonal fluctuations, making it more susceptible to infections. Some common infections include:

##### **1. Bacterial Vaginosis (BV)**

Bacterial vaginosis (BV) happens when there is an infection in the vagina that results from an imbalance of bacteria; it is often caused by douching, unprotected sexual intercourse, or lack of proper hygiene, which enables some harmful bacteria to multiply out of control. Symptoms of BV may include discomfort along with a burning sensation when urinating, as well as a strong fishy smell and a thin, grayish-white discharge (8). If BV is left untreated, there are greater chances of developing pelvic inflammatory disease (PID) as well as STIs. Metronidazole and clindamycin are usually prescribed antibiotics, while probiotics may be used to help restore balance. Avoiding douching, protecting oneself during sexual intercourse, and proper washing with mild soaps are some ways to prevent this condition.

##### **2. Yeast Infections (Candidiasis)**

A yeast infection is an overgrowth of Candida yeast that forms when an individual's hormone levels change, an antibiotic is taken, or the person has a weakened immune system. Some effects include intense itching, irritation, a thick white cottage cheese-like discharge, and pain or burning sensation during urination or intercourse. With discomfort taken into consideration, the infection can be treated using antifungal medications. Antifungal medications can be taken orally in the form of fluconazole or topical creams that are applied to the infected area (9). Recurrence can be avoided if certain measures are followed. The wearing of cotton 'breathable' underwear allows the vaginal area to be dry and well ventilated, which prevents excess moisture growth. Excessive sugar intake should be avoided as high sugar levels help Candida growth. Maintaining a diet rich in probiotics, fiber, and vital nutrients helps strengthen the immune system and also aids in sustaining an appropriate vaginal pH balance. Good practices such as changing out of wet clothes for dry ones or avoiding very tight synthetic clothing can also decrease the chances of infection. These practices can greatly reduce the chances of recurrent yeast infections.

##### **3. Urinary Tract Infections (UTIs)**

Cause: An infection of the urinary tract, where bacteria get in mostly due to E. coli from poor wiping practices or keeping a tampon on for long hours.

Symptoms:

1. Urination that is painful and occurs frequently
2. Urine that is dark and/or has a foul smell
3. Pain felt in the lower region of the abdomen.

Treatment: Medications such as trimethoprim and nitrofurantoin.

Prevention

1. Drink plenty of water.
2. Wipe from front to back.
3. Pass urine before having sex and after having sex.

##### **1. Toxic Shock Syndrome (TSS)**

Toxic Shock Syndrome, or TSS, is rare but deadly and can happen due to a bacterial infection from Staphylococcus aureus (10). It is often linked to wearing tampons for extended periods of time. When tampons are used for prolonged periods of time, they can lead to a situation in which bacteria feast and grow at a very fast pace, causing the release of toxins. These toxins inflict a multitude of symptoms, including but not limited to a very high fever, vomiting, diarrhea, low blood pressure, and a rash that resembles sunburn. If TSS is ignored, it will develop at a rapid pace, which may lead to death or organ failure. The patient suffering from TSS requires immediate assistance and needs to be treated with antibiotics along with effective therapeutic treatment to restore their health.

Good menstrual hygiene and proper use of tampons act as a preventer for TSS. Tampons should be changed every four hours, should be of the minimum necessary absorbency, and women should also opt for pads or cups as they possess less risk (11). Maintaining proper and enhanced hygiene lowers the chance of an infection. Regular changing of the vaginal product used, combined with washing the vaginal area using gentle soap without any scent, helps to maintain the balance of bacteria. Avoiding douching is vital because it alters the natural pH and so is not recommended.

Other precautionary measures take into account the intake of adequate liquids, a balanced diet for immune health, and breathable cotton underwear to minimize moisture retention. Tight synthetic clothes should be avoided as these form a warm, moist environment that is conducive to bacterial growth. Safe sexual practices is another important step, as most infections get aggravated during menstruation (12). Adhering to these hygiene and preventative measures greatly reduces the chances of sustaining an infection, TSS included, and positively affects the general state of reproductive health. Some mild infections can often be treated with home care or an over-the-counter remedy, but once the symptoms persist more than a couple of days, a medical intervention is necessary. If foul-smelling discharges are present, it can also signal an underlying infection that could be an insult without medicine. In addition, severe pelvic pain or fever could be presenting a much deeper issue like pelvic inflammatory disease (PID) or a serious vaginal infection

(13). One of the critical offenders of menstruation-related infectious complications is toxic shock syndrome with frenzy (TSS), which requires instant emergency attention. Seemingly ordinary symptoms like high body temperature, extreme fatigue, skin rash that looks like sunburn, and flu-like manifestations should be treated with caution since they might signify TSS. The diagnostics should not be taken lightly, as any of these symptoms could lead to reproductive health-related complications, and imperative action with these symptoms is recommended.

### Conclusion

Menstrual hygiene is crucial to maintaining reproductive health since menstruation in itself is a natural body function that can lead to certain infections if not properly taken care of. Educating oneself on the possibilities of infection, their signs, and how to halt them aids in preserving one's health. Effective proactive measures like seeking appropriate healthcare, practicing good hygiene, and being careful about one's health choices go a long way in maintaining reproductive health along with a smoother menstruation cycle and reduced chances of infections.

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