

Premenstrual Dysphoric Disorder: Patterns, Causes, and Effects

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ABSTRACT

Premenstrual Dysphoric Disorder (PMDD) is a condition that many women suffer during the later phases of their menstrual cycle. To clarify, it is nothing but a severe and less common form of Premenstrual Syndrome. A woman goes through the period cycle every month to prepare for motherhood as she grows older, but the side effects she may experience are not discussed enough since there is usually a discomfort attached to this specific conversation. Moreover, when considering menstrual conditions, most women surprisingly are actually only familiar with PMS. While PMS affects most premenopausal women, PMDD is a condition that can cause much more severe repercussions and has to be recognized. This research paper brings attention to PMDD and provides insight on the causes and effects of this certain condition. A woman suffering PMDD does not only experience physical symptoms that can have an effect on her daily routine, but also has intense emotional symptoms that restrict her control on her behavior. These symptoms can heavily strain a female's relationships with other people and disrupt her work and/or personal environments. The treatment options available for PMDD currently are temporarily effective, and in fact, experts are still trying to find the exact cause of PMDD to develop a more permanent treatment for the condition. Presently, the best treatment options are SSRIs, and others include hormonal medications and therapy which are helpful in the psychological symptoms of PMDD. This paper explains the extent to which these specific treatments are productive and how they work.

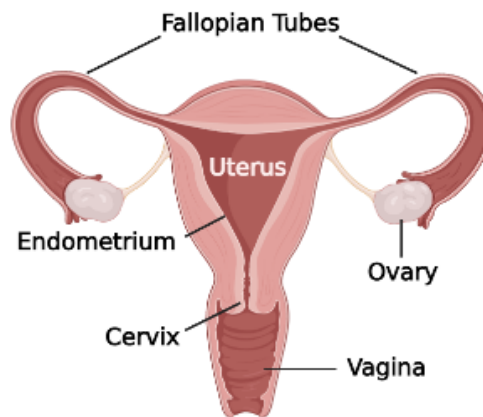
INTRODUCTION

Every month, a female experiences the cycle of menstruation to prepare her for possible pregnancy as she gets older. This cycle is known as a woman's period. Although this is a vital part of the growth of the reproductive system, there are many attached side effects that occur during the process of menstruation. These problems include dysmenorrhea, amenorrhea, PMS, and more. A common perception regarding menstrual issues is that they are mostly related to excessive or insufficient bleeding, irregular cycles, and other physical symptoms. On the contrary, periods do not only affect the physiological characteristics of a female's body, but can also disturb the mental aspects as well. PMS, or Premenstrual Syndrome, is an example of a common disorder that premenopausal women suffer which results in both physical, mental, and behavioral changes. However, a lesser known and more severe form of PMS can be identified as PMDD, otherwise known as Premenstrual Dysphoric Disorder. The contrasts between these two conditions are often overlooked and many times, PMDD is either unknown as a condition, or automatically grouped with PMS. Therefore, it is important to note the differences between PMS and PMDD when identifying the problems a female experiences during her menstruation cycle, and eventually evaluating the proper treatments for the specific issue.

THE MENSTRUAL CYCLE

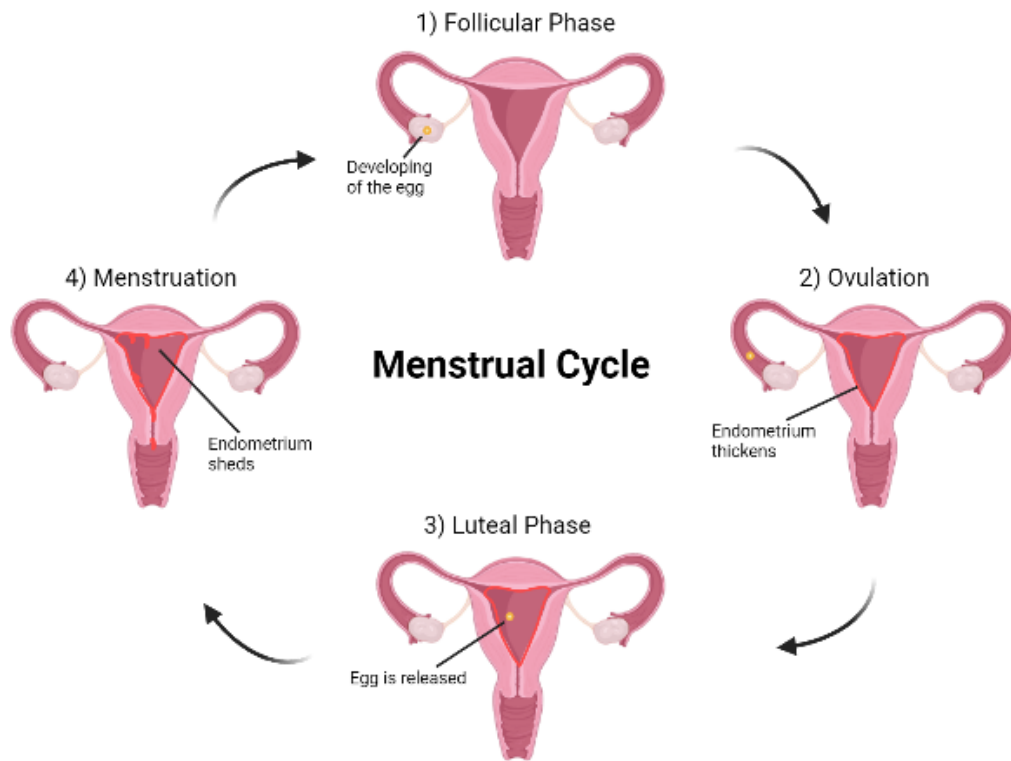
Menstruation is essentially a woman's monthly bleeding to serve the purpose of developing her body for future pregnancy. During menstruation, hormones send a signal to the uterus (womb) to discard or shed its lining, which is called the endometrium. The average duration of the cycle takes 28 days, with it being divided into 4 phases: menstruation, the follicular phase, ovulation, and the luteal phase.

Menstruation is when the actual event of the shedding of the uterus lining occurs and flows out of the vaginal area. The formation of the uterine lining occurs for the implantation of a possible released fertilized egg. If there is no fertilized egg, then the lining will shed. The period consists of blood, mucus, and cells from the endometrium. The length of this particular process typically takes up to 3 to 7 days. The follicular phase starts on the first day of the period cycle and lasts for approximately 13 to 14 days. This is when a hormone is released to prompt the production of follicles on the surface of an ovary. To clarify, a follicle is a tiny, spherical group of cells, and an ovary is the female reproductive organ. Once this happens, one follicle will usually develop into an egg. The uterus lining will also thicken during this part of the cycle. Ovulation occurs soon after the follicular phase and during this step, a mature egg is released from an ovary and moves along the fallopian tubes towards the uterus. This process generally happens once each month. After ovulation, the luteal phase takes place before repeating the process of menstruation again. Cells in the ovary release progesterone and estrogen, which are both hormones that play a significant role in a female's reproduction as they heavily support menstruation and pregnancy.



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Figure 1: Diagram of female's reproductive system.



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Figure 2: Diagram of the menstrual phase which includes the follicular phase (top middle), ovulation (right), the luteal phase (bottom middle), and menstruation (left).

BRIEF BACKGROUND OF PMDD

Premenstrual Syndrome is defined as the recurrent moderate emotional and physical symptoms that consistently occur during the luteal phase of the menstrual cycle, or one to two weeks before the actual period starts. It affects around 20 to 32 percent of premenopausal women, but most women, in general, have at least some symptoms of PMS. They may be different for everyone as a woman might have physical, emotional, or both. In addition, they are likely to change through age. The emotional symptoms include mood swings, depression, anxiety, irritability, and more. The physical symptoms consist of acne, bloating, breast swelling, headaches, and more.

There is no set test for PMS, but there is a criteria to diagnose the condition, which means symptoms must:

- Happen around five days (luteal phase) before the period takes place for at least three consecutive menstrual cycles
- End around four days after period ends
- Prevent you from doing regular activities and enjoying them

BRIEF BACKGROUND OF PMDD

Premenstrual Dysphoric Disorder is a more serious form of PMS. Like PMS, PMDD causes physical and emotional symptoms during the menstruation cycle. In addition, symptoms emerge in the luteal phase of menstruation and remit usually around the follicular stage, when hormones are more stable. However, these symptoms are more severe in the way that they might interfere with a female’s life significantly. In fact, they can actually interfere with school, work, and relationships most of the time and damage these factors. This condition affects up to 10 percent of women, which in comparison to PMS rates, is notably lower. Essentially, PMDD can be considered a severe disorder that largely affects a woman’s mood and increases her sensitivity to stress in the menstrual cycle, especially in the luteal phase.

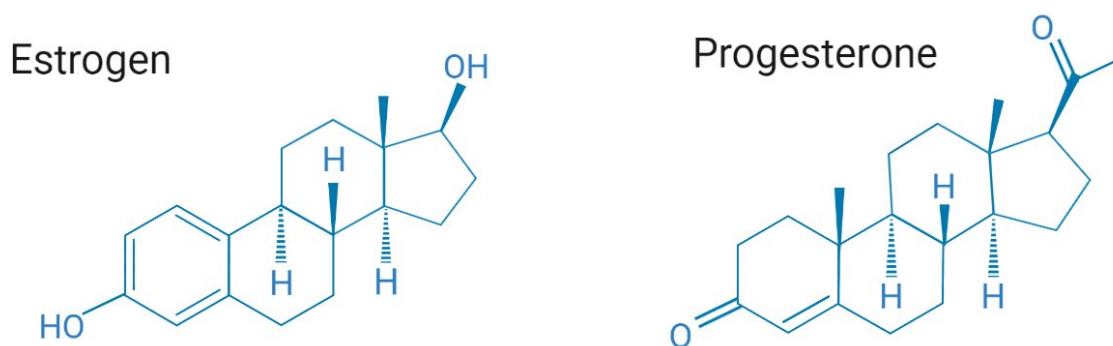
Table 1: The table shows the similarities and differences in the symptoms of PMS and PMDD. The middle row shows the physical symptoms of both conditions, while the bottom row shows the emotional symptoms.

	PMS	PMDD
Physical	<ul style="list-style-type: none"> ● Headaches ● Bloating ● Cramping ● Insomnia ● Acne ● Breast Tenderness ● Sugar Cravings 	<ul style="list-style-type: none"> ● Headaches ● Bloating ● Cramping ● Insomnia ● Acne ● Breast Tenderness ● Sugar Cravings ● Joint Pain ● Muscle Pain ● Hot Flashes ● Extreme Fatigue ● Appetite Changes
Emotional	<ul style="list-style-type: none"> ● Irritability ● Mood Swings ● Anxiety ● Depression ● Sleep Disturbance 	<ul style="list-style-type: none"> ● Irritability ● Mood Swings ● Anxiety ● Depression ● Sleep Disturbance ● Bouts of Extreme Rage/Sadness ● Difficulty Concentrating ● Feelings of Hopelessness ● Suicidal Thoughts ● Decreased Interest in Usual Activities ● Stuttering/ Difficulty remembering words ● Distorted Self-image ● Spending lots of time in bed ● Paranoia

To clarify, PMDD includes all the symptoms of PMS plus the symptoms unique to it as well. Based on this table, it is clear that in comparison, the symptoms of PMDD are much more severe than PMS. While PMS may result in common symptoms like mood swings and irritability, PMDD can lead to extremely depressing bouts of rage and/or sadness and even women feeling suicidal.

CAUSES OF PMDD

Risk Factors for PMDD include anxiety or depression, PMS, family history of menstrual problems or other mood disorders, and personal history of trauma, abuse, or other stressful events. But apart from these risk factors, the causes of PMDD and even PMS are not clearly understood. The closest explanation for why PMDD may occur is the fluctuations in hormone levels during the menstrual cycle. To clarify, a hormone is basically a chemical messenger that coordinates different functions in the body. Estrogen and progesterone, in particular, are both hormones that play an important role during menstruation. Estrogen is a hormone associated with female reproductive organs and is responsible for developing and regulating female sexual characteristics. Progesterone is also a hormone that plays an important role in the reproductive system as it supports menstruation and helps in the early stages of pregnancy. Two other very important hormones in the menstrual cycle are LH, luteinising hormone, and FSH, follicle stimulating hormone. LH generally helps control the menstruation cycle, especially in the ovulation phase. FSH also manages the menstrual cycle and mostly stimulates the ovaries to produce eggs.



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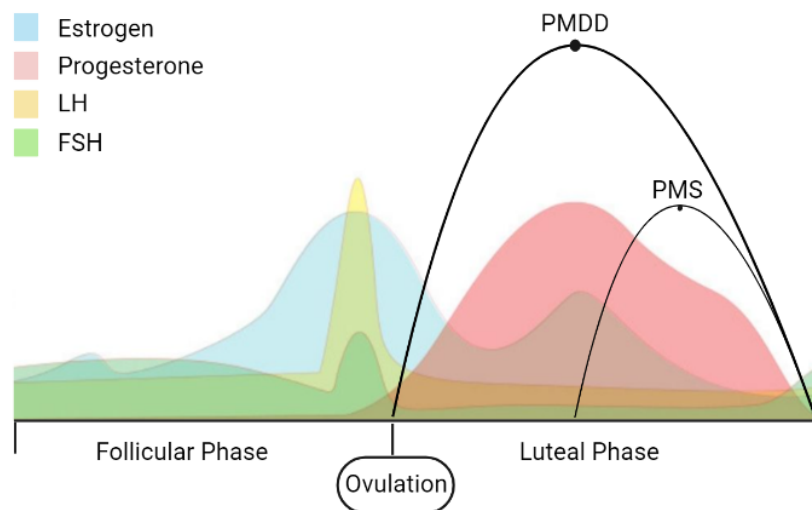
Figure 3: This image shows the chemical structures of estrogen and progesterone, the two most important hormones in the reproductive system of a female.

ROLES OF HORMONES AND NEUROTRANSMITTERS IN PMS AND PMDD

In the menstrual cycle, it is normal to have fluctuations in hormone levels. In fact, each woman has her own individual hormonal variations that shape her physical and mental state. In other words, receptors in the brain and other parts of the body react to these hormone fluctuations, resulting in the range of physical and mental symptoms that occur and affect a woman's daily life. Most of the time, however, hormones affect a female's mood according to her current menstrual phase. In the follicular phase, most women find their mood to be generally lighter and containing more energy. Estrogen is typically low when this phase starts, but rises as the follicular stage progresses. As estrogen levels increase, women may notice a more positive affect on their emotions. This is because estrogen, and even other hormones like progesterone, are linked to serotonin. Serotonin is a neurotransmitter that plays a key role in bodily functions such as sleep, digestion, mood, and more. There is a brief period of time where estrogen levels decrease before

ovulation. During ovulation, there is a sudden surge in estrogen and LH, which leads to a positive emphasis in a woman's mood. After this, progesterone levels rise before decreasing in the luteal phase again. The luteal phase generally leads to a low mood because of the decrease in estrogen and progesterone, and ultimately, a dip in serotonin.

Since symptoms of PMS and PMDD occur during the luteal phase, where females generally have a lower mood, women with these conditions are more sensitive to hormones like estrogen and progesterone. Therefore, it is not wrong to say that cyclical changes in hormone levels definitely do influence the severity of PMS. In addition to hormonal changes, chemical changes regarding neurotransmitters in the brain also have an important function in the menstrual cycle. Neurotransmitters are nothing but chemical messengers, just like hormones are. They, along with hormones, also regulate emotions, mood, and behavior. Accordingly, neurotransmitters will also factor into symptoms or PMS and PMDD most of the time. For example, a dip in estrogen along the cycle will lead to a release in norepinephrine. Norepinephrine is both a hormone and neurotransmitter, and when it is present, it can prompt the decreasing production of dopamine, acetylcholine, and serotonin. These three neurotransmitters are directly related to making the body and mind feel good, excited, and happy. Thus, when there is a decline in these neurotransmitters because of the uprise of norepinephrine, a woman's mental health will be poorly affected.



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Figure 4: This visual explains the general fluctuation in hormone levels that a woman experiences during the menstrual cycle. It also shows the stages where PMDD and PMS starts and ends, which is during the luteal phase.

MENTAL HEALTH AND PMSS

PMDD is classified as a mood disorder because it has a lot of negative control on a woman's emotions. In this way, the disorder is heavily influential on mental health and stress. History of severe stress exposure is associated with PMDD. Traumatic events, especially in childhood, such as constant dysfunctional relationships in households and physical or emotional abuse are directly related to damaged mental function. Therefore, in the case of PMDD, there

have been reports among women living with the condition that have experienced stressful events and childhood abuse in their life.

PMDD, as a result, worsens the mental health status of a woman by inducing levels of anxiety, depression, and more. This is why along with physical symptoms, there is a large number of emotional symptoms as well. The psychological aspects of PMDD are very important to consider when a female is suffering with the condition as these can go as far as her having suicidal thoughts. While physical symptoms can be temporarily numbed, it takes more of an effort to stabilize the mental characteristics of PMDD. If they are not controlled, emotional symptoms can have a horrible effect on a woman's work and social environments. In other words, they can strain her personal and/or professional relationships immensely as her behavior is being controlled by the symptoms of PMDD.

TREATMENTS FOR PMDD

Unfortunately, there is no standard treatment for PMDD that would help cure the condition. However, common medications and forms of therapy offer temporary treatment that might help in balancing emotions or subsiding them. The main goals in finding a treatment for a condition like PMDD are to reduce symptoms and lead to improvement in social functioning. These factors will ultimately result in an improvement in the quality of life for a woman suffering PMDD.

Antidepressants (SSRIs)

Antidepressants are very common in treating or controlling PMDD. SSRIs (selective serotonin reuptake inhibitors) are a type of antidepressant, and they are actually the first recommended treatment for PMDD most of the time. SSRIs are mostly used in depression disorders, anxiety disorders, and other psychological conditions which is why they work very well in controlling PMDD. They typically function by boosting brain chemicals, or neurotransmitters, and stabilizing one's mood as a result. Types of SSRIs are citalopram, fluoxetine, paroxetine, and more. These types of antidepressants are generally effective during the luteal phase and will reduce long-term symptoms. They are usually available in the form of oral contraceptives, or pills, and the dosages may vary depending on the specific SSRI used. Normally, it is recommended that one should not start or stop taking SSRIs suddenly, but some studies also show that for some struggling with PMDD and taking SSRIs during just the luteal phase can be effective without side effects being too intense.

SSRI	Recommended Usage	Advantages/ Disadvantages
Citalopram	<ul style="list-style-type: none"> ● 10-30 mg per day ● Full cycle/ Luteal phase 	<ul style="list-style-type: none"> ● Benefits cognitive, physical, and emotional symptoms ● Most advantageous during the luteal phase as opposed to continuous use ● Not approved by FDA
Fluoxetine	<ul style="list-style-type: none"> ● 20 mg per day ● Full cycle/ Luteal phase 	<ul style="list-style-type: none"> ● Significantly reduces symptoms ● Approved by FDA
Paroxetine	<ul style="list-style-type: none"> ● 10-30 mg per day ● Full cycle 	<ul style="list-style-type: none"> ● Benefits all types of symptoms ● Sexual side effects ● Not approved by FDA
Sertraline	<ul style="list-style-type: none"> ● 50-150 mg per day ● Full cycle/ Luteal phase 	<ul style="list-style-type: none"> ● Benefits all types of symptoms ● Sexual side effects ● Approved by FDA
Clomipramine	<ul style="list-style-type: none"> ● 25-75 mg per day ● Full cycle/ Luteal Phase 	<ul style="list-style-type: none"> ● Benefits all types of symptoms ● Sexual side effects ● Not approved by FDA

Table 2: This table shows different types of SSRIs used in treating PMDD. The middle column explains the suggested dosage amounts per day and when the antidepressant should be taken during the menstrual phase. The last column gives information on how effective the SSRI is and its side effects while also mentioning if the antidepressant is FDA approved or not for the use of treating PMDD.

Hormonal Treatments & Oral Contraceptives

Hormonal treatments usually are in the form of oral contraceptives, or pills. They reduce PMDD symptoms by inducing hormone levels in the body. The higher the levels of the hormones are, the less irritable or negative emotions are present. However, less is known about this type of treatment as studies regarding possible treatment hormones and oral contraceptives in general are shown to be inconsistent. To clarify, pills may reduce the symptoms of PMDD, but they may also make them worse. The pill can also cause major side effects and is especially not recommended when a woman is trying for pregnancy. For some however, birth control pills have actually shown to help reduce PMDD symptoms. Oral contraceptives can come in various types with different combinations of hormones. This means that a certain mix of hormones might not be as effective for women as she would hope.

Therapy/Counseling

To benefit the psychological or mental symptoms of PMDD, seeing a therapist for counseling might help for women suffering PMDD. Cognitive Behavioral Therapy, in specific, has proven to be effective for some women in managing their symptoms. This method takes an approach to form a clear idea of a woman's own thoughts, attitudes, and expectations. The goal of this treatment is to reveal and change false beliefs, because not only do situations cause one problem, but the importance attached to the perceptions of those events cause them as well. Cognitive therapy, in the case of PMDD, will help women in replacing negative thought patterns with more realistic and less harmful thoughts. Therapy, overall, significantly reduces the anxiety and depression related symptoms of PMDD and ultimately helps a woman to think more clearly and control themselves better, without their symptoms handling them.

CONCLUSION

Overall, Premenstrual Dysphoric Disorder is a condition that should be brought more attention to especially since it has such negative repercussions. While PMS is certainly more prevalent in premenopausal women, PMDD can, unfortunately, be easily attainable these days due to common mental health problems. Womens' health is very important to society and it is high time that the discussion regarding their menstrual system is not viewed as a restricted, or uncomfortable topic. Often, conditions relating to a woman's period are brushed under the carpet and ignored, but when these disorders heavily disrupt her social environments, the issue becomes much bigger. As PMDD is continuing to affect many women both physically and emotionally, it is imperative that more effective and permanent treatment options become accessible to women suffering with this condition.

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