Premenstrual syndrome (PMS) - A narrative Review

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ABSTRACT

Premenstrual syndrome (PMS) is regarded as a common, recurrent psychological and somatic illness that can impair a woman's quality of life, it is characterized by the recurrent occurrence of emotional and physical symptoms that arise five days prior to menstruation in each of the previous three menstrual cycles and are not associated with any organic disease. After the menstrual cycle begins, these symptoms go away in four days and don't come back until at least cycle day 13.Women's quality of life is significantly reduced when they have PMS. Moreover, there is a similar decrease in mental health and energy, and impaired social interactions and everyday activities when PMS symptoms developed .Therefore, it is crucial to examine and mange PMS from several angles.

Keywords: cognitive function,quality of life, Physical activity level, Premenstrual syndrome.

INTRODUCTION

Premenstrual syndrome (PMS) is the term used to describe a group of physical and psychological symptoms that occur during the luteal phase of the menstrual cycle and are clinically significant. These symptoms can cause severe discomfort and functional impairment. When menstruation begins, these symptoms go away in a few days (1). It is defined by The American College of Obstetricians and Gynecologists (ACOG) as the cyclic presence of physical and emotional symptoms that are unrelated to any organic disease and that appear during the five days before menses in each of the three previous menstrual cycles. These symptoms disappear within four days of the onset of menses and do not recur until at least cycle day 13 (2) .

With a 48% frequency, PMS affects a sizable fraction of women who are fertile. Physical, psychological, and behavioral symptoms reoccur frequently, which is one of its defining characteristics. Abdominal bloating, body aches, cramps, tenderness/fullness, headaches, nausea, edema in the limbs, and weight gain are examples of physical symptoms. Anger, impatience, anxiety, changes in appetite, libido, impaired attention, lowered mood, poor sleep or increased demand for sleep, tension, and withdrawal from routine activities are examples of psychological and behavioral symptoms (3).

The cause of PMS is still unknown despite a great deal of research, while some plausible explanations have been put out. There are rumors that women who experience PMS are more vulnerable to changes in sex hormone levels that occur during the menstrual cycle propose that alternation may occur as a result of withdrawal or exposure to allopregnanolone, a metabolite of progesterone(4). According to clinical research, women with PMS and PMDD also report late-luteal phase symptoms such trouble focusing and decreased productivity at work that may be connected to changed "cold" cognitive functioning. Changes in cognitive-affective processes may also be involved in symptoms like affective lability, feeling overwhelmed, or feeling out of control(5).

Aoki et al.'s latest study from 2022 showed that PMS sufferers saw a reduction in cognitive function throughout the luteal phase. This decrease was linked to an increase in negative mood and was only seen during the luteal phase—not the follicular phase (6). According to earlier research, exercise significantly improved pain tolerance, lowered anxiety and depressive symptoms, raised endorphin levels, and reduced symptoms of adrenal cortisol. It also significantly decreased pain and PMS-related physical and mental symptoms (7).

Background

Premenstrual syndrome, or PMS, is a recurrent luteal-phase disorder that is characterized by significant behavioral, psychological, and physical changes that impair social interactions and everyday activities. One severe type of PMS is called premenstrual dysphoric disorder (PMDD) (8).

Compared to women without PMS, women with PMS typically have a far worse quality of life, higher rates of absence from work, reduced productivity at work, strained interpersonal relationships, and more frequent trips to the doctor (9).

Prevalence

According to estimates, between 20 to 80 percent of women who are fertile experience PMS, which negatively affects their quality of life (10). 18803 participants from 17 publications made up the meta-analysis, and 48% of the participants had a pooled prevalence of

PMS. In Europe, 85% in Africa, 46% in Asia, and 60% in South America, there was a reported pooled prevalence of PMS (11).

Due to the retroactive character of these data, recall bias is inevitably present in the majority of studies on the prevalence of premenstrual problems. Nonetheless, the results of these investigations align with the limited number of epidemiological research that employed prospective symptom ratings. Research from both prospective and retrospective research indicates that moderate to severe symptoms are present in 5–8% of women with hormonal cycles. Nonetheless, according to some research, premenstrual symptoms may be considered clinically important in up to 20% of women who are fertile (112).

Signs and Symptoms of premenstrual syndrome

Periodic mood disorder (PMS) has been linked to various symptoms. These signs and symptoms come on periodically. Throughout many cycles, the severity and duration of the symptoms may vary (13). Anxiety and depression are two of the most prevalent diseases in primary care and the general population. When two disorders coexist, they satisfy the criteria for each. Although it might be challenging to distinguish between the two, it is crucial to recognize and manage both conditions because they have substantial rates of morbidity and death (14).

Breast tenderness, food cravings, increased hunger, discomfort, exhaustion, water retention in specific body regions, and acne are the most common physical symptoms of PMS. Anger, pain, sadness, exhaustion, and a decline in focus are the most common emotional and behavioral symptoms. Although the causes of PMS are unknown, it has been shown that the frequency and severity of PMS are influenced by a number of psychiatric and chronic disorders, as well as hormonal, familial, and environmental factors (15).

These emotions can last anywhere from a few days to two weeks. Women typically have the same set of symptoms from one cycle to the next; symptoms typically get worse 6 days beforehand and peak 2 days prior to menstruation (12).

Premenstrual dysphoric disorder (PMDD) affects a large number of women in their reproductive years in the week before their periods. PMDD patients' predominant behavioral and emotional symptoms include tension, irritability, depression, and mood swings. The degree of symptom load varies across women; although some have modest symptoms, a tiny percentage have severe and incapacitating symptoms. According to Joanne (17), these symptoms also negatively impact how well women perform in general and in their daily lives.

General symptoms (fatigue and loss of energy, feeling sluggish or agitated and restless), cognitive symptoms (poor attention and concentration, slow thinking, distractibility, impaired memory and indecision), psychological symptoms (apprehension, derealization or depersonalization, irritability, and atypical anger), musculoskeletal symptoms (muscle aches and pains, tension in the muscles, headaches), gastrointestinal symptoms (dry mouth, choking sensation, churning stomach sensation, nausea, vomiting, and diarrhea), cardiovascular symptoms (palpitations, tachycardia, chest pain, and flushing), respiratory symptoms (shortness of breath, and occasionally hyperventilation), and neurological symptoms, such as vertigo, paraesthesia, impaired vision, and dizziness, and genitourinary symptoms, such as decreased libido and micturition issues (17).

Research has shown that between 5% and 8% of women suffer mild to severe symptoms, and some estimates suggest

that 20% of all fertile women have premenstrual issues that are clinically relevant (18).

Impact of premenstrual syndrome on women

The quality of life, productivity, and academic achievement of young women are adversely affected by all of these grievances. Since untreated PMS is more likely to affect a person's sexual life, it can lead to higher degrees of sexual distress, which can worsen psychological issues and relationships. Additionally, in hormone-sensitive girls, there is a link between PMS and an elevated risk of suicide (19).
The recurrence of symptoms for at least two consecutive cycles is the basis for the diagnosis of the illness. Throughout a woman's productive years, PMS can strike at any time and can vary in intensity from mild to severe (20).

Risk factors

Regarding the risk factors that lead to PMS, there is general agreement from numerous research. These include lifestyle variables such regular menstruation, physical activity, eating fast food, drinking coffee, tea, and alcohol every day, and smoking cigarettes, as well as a history of PMS in first-degree relatives (21).

The following factors were found to be strongly linked to premenstrual syndrome: elevated body mass index (BMI), sedentary lifestyle, exposure to passive smoking, positive family history of PMS, excessive coffee use, and frequent fast food consumption (22).

In addition, white women, smokers, young age, and high BMI were associated with higher rates of PMS. Women who are obese (BMI $\geq$ 30 kg/m²) are almost three times more likely to experience PMS than women who are not obese (23). Obesity's effects on progesterone and estrogen can disrupt neurotransmitter function. By boosting serotonin synthesis, transport, reuptake, receptor expression, and postsynaptic responsiveness, estrogen improves the function of serotonin. Consequently, decreased serotonin function brought on by lower estradiol levels linked to obesity may exacerbate PMS (24).

There is a noteworthy correlation between BMI and PMS. This was consistent with a prospective study's finding that PMS development and BMI had a substantial positive association. Premenstrual symptoms were much more common in women with obesity at baseline and in lean women over a 10-year follow-up period. Additionally, a family history of PMS was found to be a major predictor of PMS incidence. According to Rasheed and Al-Sowielem (25), 93% of female students with a positive family history of PMS had the disorder, compared to 76% of students without a family history.

The frequency and intensity of PMS symptoms were observed to be significantly impacted by an excess of sweet-tasting foods, such as cakes, chocolates, and deserts (26).

Pathophysiology of PMS

The pathophysiology of PMS could be caused by a complicated interplay between changes in central neurotransmitters and ovarian steroids, as well as by the hormones' peripheral effects (13).

Emotional and physical symptoms are caused by the interaction of cyclical changes in the ovarian hormones progesterone and estrogen, which alters brain neurotransmitters. Although the exact mechanism of women's vulnerability to ovarian steroids-induced neurotransmitter alterations is unknown, serotonin is most likely involved. It's unknown if decreased blood levels, serotonin transport, or absolute serotonin levels are connected to PMS and PMDD.

Among the other neurotransmitter systems are gamma-aminobutyric acid and opioid (27).

Diagnosis

Depending on the symptoms and when they manifest during the menstrual cycle, PMS is diagnosed. Premenstrual symptoms appear in the interval that separates the luteal phase of the endometrial cycle from the ovulation phase of the ovarian cycle. The intensity of the symptoms increases just before the menstrual cycle starts, and by the time the cycle ends, all of the symptoms have vanished.

There is an asymptomatic period that occurs between the end of the menstrual cycle and the onset of ovulation. To establish a link between the symptoms and PMS, at least one physical or psychological symptom must arise five days prior to the menstrual cycle, vanish four days after the cycle, persist for at least three menstrual cycles, and negatively impact everyday activities and interpersonal relationships (28).

A thorough evaluation of the impact is necessary in order to differentiate between women who have common cycle abnormalities and women who are severely damaged and hence need therapy. This distinction should not lead to an overdiagnosis or pathologization of premenstrual disorders. Because the fit between an end result measure and the aspects to be treated with an intervention is crucial, a thorough assessment of the effects of premenstrual syndrome provides information on which aspects of life are most affected, which helps to improve the therapy efficacy evaluation (29).

Scales that solely evaluate somatic symptoms are not as useful as questionnaires that assess the effect of symptoms. Previous research has demonstrated that measures pertaining to quality of life or symptom-related burden are more sensitive (30).

Negative consequences

Physical activity alleviates PMS symptoms by increasing levels of endorphin, decreasing levels of adrenal cortisol, causing greater pain tolerance and lesser anxiety and depression. As exercise has been shown to diminish short-term depression by distracting from intrusive thoughts and enhancing good thoughts. Exercise could help raise focus, enhancing behavior and mood (31).

On the other side, PMS is a disorder that is common among adolescent women who are reproductive age and is linked to negative effects on daily activities, disruption of familial and social relationships, physical and emotional health, work productivity, lifestyle, academic performance, absenteeism, and increased healthcare costs (33). Premenstrual syndrome is linked to a significant reduction in women's quality of life. Furthermore, as PMS symptoms worsen, there is a corresponding decline in mental well-being and vigor (34).

Conclusion

Many adolescent girls suffer from premenstrual syndrome (PMS); worldwide research has revealed that its prevalence ranges from 20 to 40%. Female PMS patients have reported experiencing cognitive symptoms such as difficulty focusing, memory impairment, distractibility, lack of confidence while making decisions, and even hesitancy. Previous studies suggested a potential connection between more severe premenstrual symptoms and declining cognitive function. Thus, PMS has a detrimental effect on daily activities, ruins social and familial connections, has an adverse effect on physical , mental health, work productivity, lifestyle and scholastic achievement, results in absenteeism, and increases healthcare costs.

Regular physical activity is necessary to improve cognitive function, which includes learning, memory, and attention. Regular exercise is supposed to improve neuroplasticity, the brain's ability to adapt and change in response to new experiences. This flexibility facilitates the consolidation of learning and memory. Exercise also increases the creation of neurotransmitters linked to alertness and a positive mood and encourages the release of endorphins, which are hormones that naturally regulate mood.

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