

Aetiology, Diagnosis and Management of Premenstrual Syndrome

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Abstract

Premenstrual syndrome (PMS) is a combination of physical and emotional disturbances that occur after a woman ovulates and ends with menstruation. More than 200 symptoms have been known as the symptoms of PMS. About 20-80% of women of reproductive age experience these disturbing symptoms. A more severe form of PMS, known as premenstrual dysphoric disorder (PMDD), occurs in a smaller number of women (2-6%) and leads to significant loss of function because of unusually severe symptoms. Biological, psychological, environmental and social factors all seem to play a role in the onset of PMS. Several diagnostic tools and approaches have been suggested to facilitate the recognition of the PMS. A thorough medical history should be obtained and careful physical and pelvic examinations should be conducted. In addition, having a menstrual diary can help better diagnose the onset and end date of the symptoms. Although there seems to be no ultimate cure for PMS, there are many options available to better manage the signs and symptoms.

Keywords: Premenstrual dysphoric disorder; Premenstrual syndrome; Diagnosis; Management

Introduction

The luteal phase starts from the time of ovulation and ends at the onset of menses. Some women experience a variety of disturbing symptoms during their luteal phase and beginning of their menstrual bleeding that are known as premenstrual syndrome [1]. Premenstrual syndrome (PMS) is a combination of physical and emotional disturbances that affects 20–80% of women of reproductive age [2]. The duration and severity of the PMS varies in women and from cycle to cycle. In general, more than 200 symptoms have been known as the symptoms of PMS. The most common physical symptoms are fatigue, bloating (due to fluid retention), breast tenderness and pain, acne, sleep disturbances and appetite changes. The most frequent mood-related symptoms have been reported to be anger and irritability, anxiety, tension, depression, crying, oversensitivity and exaggerated mood swings (Table 1) [3].

Premenstrual dysphoric disorder (PMDD) is a more severe form of PMS that occurs in a smaller number of women and results in remarkable disability and loss of function. It has been shown that 2-6% of women experience the PMDD within their life span [2]. Women with the PMDD complain of severe pain, breast tenderness, headaches, joint and muscle pain, bloating and weight gain as well as severe psychological symptoms such as sleep disturbance, limited concentration, irritability, anger, tension, marked depressed mood and mood liability. The symptoms interfere with their work, social activities, interpersonal relationships and quality of life [4].

Biological, genetic, psychological, environmental and social factors all seem to play a role in the onset of the symptoms. Research has shown that the risk of PMS in women whose mothers have had PMS is 70% compared with 37% in women whose mothers have not been affected. In addition, the rate of PMS in monozygotic twins is 93%, compared with that of dizygotic twins which is 44% [5]. Further to these factors, it has been reported that past, present or current domestic violence can increase the risk of PMS in women who have experienced an abusive relationship [6]. Some reports indicate that younger women, black women and women with longer menstrual periods are more likely to report premenstrual symptoms [7]. Research has shown that black women tend to have a higher prevalence of food cravings than white women [8]. While white women are more likely than black women to report premenstrual mood changes and weight gain [9]. Pain has been

Common PMS Symptoms	
Irritability	Edema, Weight Gain
Decreased/increased Libido	Mood Changes, crying spells
Fatigue, Low energy	Headaches
Cravings for sweets	Salt cravings
Feelings of isolation	Confusion
Muscles aches, weakness	Increased argumentativeness
Feeling out of control	Depression
Nervousness, anxiety	Eating binges
Sleeping difficulties	Memory loss
Brest Pain, swelling	Panic attacks

Table 1: Common PMS symptoms.

reported most highly in a sample of Chinese women in Hong Kong [10].

Aetiology and pathophysiology

Over the past 70 years, many theories regarding the aetiology and pathophysiology of PMS have pointed not to a single disorder but rather, to a collection of problems. A few theories have been suggested to explain the pathophysiology of severe PMS as follows.

- Ovarian hormone theory: Because the PMS only affects the women of reproductive age, it is assumed that the female gonadal hormones play a causative role, possibly mediated through the alteration of serotonergic activity in the brain. This theory hypothesises that PMS is caused by an imbalance in the estrogen to progesterone ratio, with a relative deficiency in progesterone [11]. Research has shown that administration of progesterone hormone during the second half of the menstrual cycle can decrease the severity of premenstrual symptoms in some women [12].

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- Serotonin theory: Serotone is responsible for maintaining a balanced mood. Estrogen and progesterone seem to affect the brain's neurotransmitters, modulate the levels of monoamines, such as serotonin, and alternate serotonergic activity in the brain [11]. It has been reported that eliminating the effect of ovarian gonadal hormones through the use of a gonadotropin-releasing hormone (GnRH) agonist may help relieve premenstrual symptoms in some women [13]. In addition, the administration of the serotonin agonist has been reported to induce mood elevation in those women who experience premenstrual psychological symptoms [14,15].
- Psychosocial theory: It is suggested that the PMS is a conscious demonstration of a woman's unconscious conflict about femininity and motherhood. It is proposed that premenstrual physical changes remind the woman that she is not pregnant and thus, has not fulfilled her traditional feminine role. Since this view is highly subjective, if not impossible, it is difficult to prove this theory through scientific evidence [13].
- Cognitive and social learning theory: This theory suggests that the onset of menstrual bleeding can be an aversive psychological event for some women. These women might have had negative and extreme thoughts about menstruation that further reinforce the severity of premenstrual symptoms. They may develop maladaptive coping strategies, such as mood swing, absence from school or work and overeating in an attempt to reduce the immediate stress [16].
- Sociocultural theory: This theory hypothesises that the PMS is a manifestation of a conflict between the societal expectation of the dual role of women as both labor forces (workers) and child-rearing mothers. According to this theory, the PMS may be a cultural expression of women's dissatisfaction with the traditional role of the women in the society [17].

Differential diagnosis

The symptoms of PMS may resemble other medical conditions such as anaemia, hyperprolactinemia, anxiety disorders, hyperthyroidism, bipolar affective disorder, hypothyroidism, chronic fatigue syndrome, panic disorder, depression, personality disorders, dysthymic disorder, systemic lupus erythematosus [2] eating disorder, disorders of adrenal system, catamenial migraine, catamenial epilepsy, collagen-vascular disease, cyclic water retention (idiopathic oedema), chronic fatigue, hypothyroidism and irritable bowel syndrome [18].

Diagnostic approaches

The diagnosis of PMS can sometimes be difficult because many medical and psychological conditions can mimic the symptoms of the PMS. In addition, there is no specific laboratory test to determine whether these symptoms certainly belong to the PMS [19].

One of helpful diagnostic approaches is to keep a menstrual diary. The diary helps distinguish the PMS from other mood disorders by recording the onset and duration of the symptoms. The symptoms of PMS usually appear during 1-2 weeks before the commencement of menstrual bleeding and disappear within a few days after the onset of menses [20]. Keeping a menstrual diary not only helps the physicians to make the diagnosis, but also increases the level of understanding of the person about her own body and moods. Once the PMS is understood and diagnosed, the individual can better cope with the symptoms [21].

Another useful tool is the Daily Symptom Rating (DSR), which documents physical and emotional symptoms over months and score their severity. According to the DSR, a within-cycle increase from follicular to luteal phase score of at least 20-50% is necessary to confirm the diagnosis of

PMS. The within-cycle percentage change is calculated by subtracting the follicular score from the luteal score, divided by the luteal score, and multiplied by 100 [(luteal score – follicular score ÷ luteal score) × 100] [22].

Psychiatric evaluation can help rule out other possible mental health conditions. In addition, a physical examination made by the general practitioner may help identify breast tenderness, headaches, swelling of ankles, feet and fingers, joint and muscle pain, bloating and weight gain [23].

Laboratory studies may also be conducted in order to screen for medical conditions considered in the differential diagnosis. Laboratory studies should include the following assessments: thyroid function tests, complete blood cell count and follicle-stimulating hormone level. The initial steps aim at excluding organic syndromes with similar manifestations [24]. Once the diagnosis of the PMS is confirmed, the physician may proceed with offering the most useful management plan for individual patient.

Management

Lifestyle and dietary changes: The PMS can be treated according to the severity of the symptoms. Current treatment recommendations include diet modifications such as eating smaller portions of meal more often, consuming meals that are high in carbohydrate and low in salt or refined sugar, reducing the consumption of caffeine and alcohol and quitting smoking [25].

Evidence suggests that exercise and physical activity help release endorphins and in turn improve general health, nervous tension and anxiety. Endorphins are neurotransmitters that contribute to euphoric feelings and affect mood, perception of pain, memory retention and learning [25,26].

Stress reduction activities: A variety of methods for stress reduction and relaxation may be used including emotional support from family and friends, counselling and education, individual and couples therapy, stress/behaviour management strategies, anger management, self-help support group and cognitive-behavioural therapy [27].

Supplements: A variety of herbal and mineral supplements have been reported in the literature to be effective in the reduction of the severity and duration of the premenstrual symptoms. These include but not limited to daily calcium supplements (1000 mg) [28], magnesium (200 mg) [29], vitamin E (400 units), vitamin B6 (pyridoxine) [30], chaste tree (chaste berry or vitex agnus castus) [31], St John's Wort [32], evening primrose oil (3000–4000 mg) [25], Black Cohosh and Dandelion [33].

Research has reported that in order for these therapies to be effective, they need to be taken for at least two consecutive cycles [12,28,29]. In addition, special care must be taken while using the supplements as their high doses may be toxic and harm the liver in some individuals. Patients need to consult with their physicians prior to taking any supplements [34].

Medications: A variety of medications have been suggested to be used to treat moderate-severe symptoms of PMS. However, not all of them have been effective in all people and there is controversy over their efficacy.

- Diuretics: Diuretics increase the rate of urine output, eliminating excess fluid from the body tissues. For example, spironolactone is a prescription diuretic that has been widely used to treat swelling of the hands, feet or face [35].
- Analgesics and anti-prostaglandin agents: The analgesics and anti-prostaglandins are commonly used for menstrual cramps, headaches

and pelvic discomfort. The nonsteroidal anti-inflammatory medications (NSAIDs) such as ibuprofen, naproxen and mefenamic acid have been shown to be very effective. However, their long-term use may cause serious side effects such as stomach ulcers [36].

- Antidepressants: Antidepressants, such as fluoxetine and paroxetine, act through increasing the levels of brain chemicals (such as opioids and serotonin) and help treat the mood disturbances related to PMS [25].
- SSRIs (selective serotonin reuptake inhibitors) and SNRIs (selective noradrenaline reuptake inhibitors): This group of medications have mood stabilising and antidepressant effects and have been shown to remarkably improve the symptoms of PMS. They play their role through increasing brain chemicals, such as serotonin and noradrenaline, both of which appear to decrease during premenstrual phase in the women with the PMS [37].
- Oral contraceptive pills (OCPs): Some women with the PMS are prescribed the OCPs in order to balance their ovarian hormones fluctuations. Research has reported that the new birth control pills, with improved hormonal formulations, seem to be more beneficial and effective in the alleviation of premenstrual symptoms [38,39].
- Mirena IUD (Intra Uterine Device): The Mirena IUD releases a low-dose progesterone-like hormone, which may help suppress ovulation and reduce the PMS symptoms in some women [40].
- Depo-Provera: This injectable contraceptive stops ovulation and may help relieve the premenstrual symptoms. Its side effects may include irregular bleeding and mood changes in some women [41].
- Ovarian suppressors: Some medications such as danazol have been shown to suppress ovarian hormone production and decrease the severity of PMS. However, they may not be used over a long period of time because of their side effects [42]. It has also been reported that the complete suppression of ovarian function by administering gonadotropin-releasing hormone (GnRH) analogues may help some women with disturbing premenstrual symptoms. These GnRH analogues may not, however, be used for a long period of time (more than six months) due to their negative impact on bone density and an increased risk of osteoporosis [25].
- Bilateral salpingo-oophorectomy: Removing both ovaries has been reported to eliminate severe PMS. However, it has been reported to lead to early menopause and severe menopausal symptoms [43].

Conclusion

Premenstrual symptoms are prevalent among women of reproductive age. A variety of diagnostic venues and therapeutic approaches have been suggested in the literature to reduce the severity and duration of the symptoms.

Premenstrual suffering is not to be dismissed or taken for granted. If a woman consistently suffers from several physical and mood/emotional symptoms, it is recommended to consider referring to a professional for a diagnosis and treatment plan. Despite the high prevalence of PMS, many women do not seek help from the health care professionals. This may be because of their lack of knowledge on the issue as they may think that the symptoms are just part of being a woman and must be tolerated. In addition, they may not be aware of a variety of potential management plans and treatments to this problem. Women should be informed about the symptoms and be encouraged to seek help from their physicians, refer to women's health clinics or

talk to a psychologist. The supportive therapeutic approaches can help decrease the severity of the symptoms and improve the quality of life of the women and their families.

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