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 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 serotinergic 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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Table 1: Common PMS symptoms.

| 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. |
A phase score of at least 20-50% is necessary to confirm the diagnosis of PMS. The within-cycle percentage change is calculated by substracting 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 Minera 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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