Chapter 3

Pre Menstrual Syndrome

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Additional information is available at the end of the chapter

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Abstract

Approximately 80–90% of women experience some symptoms in the premenstrual period at some point in their reproductive years. Teenagers often present with moderate to severe symptoms, while women in the fourth decade of life appear to have worse symptoms with the severity of the disease worsening with increasing age up until menopause. Obesity and smoking have also been identified as risk factors. Symptoms could be physical, psychological, emotional, environmental and/or behavioral and affect the ability to perform normal daily activities as well as adversely affect interpersonal relationships. Though several theories have been propounded, the exact cause of premenstrual syndrome is unknown. Management of this disorder requires a multi-disciplinary approach involving the general practitioner, the general gynecologist or a gynecologist with a special interest in PMS, a mental health professional (psychiatrist, clinical psychologist or counselor), physiotherapist and dietician.

Keywords: menstruation, psychosomatic menstrual syndrome, girls

1. Introduction

A syndrome is a group of symptoms and/or signs associated with a medical disease or disorder, often occurring concurrently. Premenstrual syndrome (PMS) can be defined as a group of physical and emotional symptoms and signs usually occurring within the last 14 days of the menstrual cycle, that is, from ovulation to the onset of menstruation, of sufficient severity to result in deterioration of interpersonal relationships and affect normal activities [1]. The symptoms span a range of medical specialties; from the gynecological to the psychiatric. PMS is included as a diagnostic category in the 10th edition of the International Statistical Classification of Diseases and Related Health Problems (ICD) with its' more "severe" form,

Premenstrual Dysphoric Disorder (PMDD), included in the 5th edition of the Diagnostic and Statistical Manual for Mental Disorders (DSM) [1, 2].

Premenstrual syndrome became a recognized medical disorder over the last century. It was initially thought to be an 'imagined' disease all in the heads of 'crazy' women [3]. Later it was presumed that the female reproductive organs had complete control over the woman and energies diverted from reproductive organs caused suboptimal functioning as such women involved in manual labor required more treatments than those who only exercised their brains [4]. Till date, symptoms of PMS are often viewed with skepticism or used in mockery of the female sex or the idealism of gender equality such that many females who suffer from this condition are unwilling to seek help or even admit to having difficulty managing the psychological symptoms associated with their menstrual cycles. This chapter methodology derives from a synthesis of the available literature under the MESH search term premenstrual and focus group discussion of women attending a tertiary health facility in Southern Nigeria.

Premenstrual syndrome was named by a British physician Katharina Dalton in 1953 [5]. PMS psychological symptoms had been described as early as the time of the ancient Greeks, but it wasn't until 1931 that this disorder was recognized by the medical community. This diagnosis was made popular by a paper presented at the New York Academy of Medicine by Robert T. Frank titled "Hormonal Causes of Premenstrual Tension" [6]. Robert Frank theorized that excess estrogen levels were the cause of symptoms experienced by affected women. In 1981, Dalton served as the chief defense medical expert in a murder trial in London. She successfully argued that the defendant was not responsible for murdering her lover because she suffered from severe PMS. This trial caught the attention of different viewers in the United States and brought publicity to PMS. PMS or the "disease of the 1980s" became a media event. More importantly, PMS acquired medical legitimacy, "after years of telling women their problems were 'all in the head,' the proportion of doctors who accepted PMS as a real disease reached critical mass" [7].

2. Epidemiology

Approximately 80–90% of women experience some symptoms in the premenstrual period at some point in their reproductive years. However, only 20% of these women meet the diagnostic criteria for PMS, of these; 10% are severely affected and 3–8% have PMDD [1].

Teenagers often present with moderate to severe symptoms, 14–88% of teenage girls are affected, with the older teenagers more likely to have symptoms than the younger teenagers. PMS and PMDD are associated with a higher risk of Anorexia nervosa, Bulimia nervosa and substance abuse. It is also more likely to occur in women who have suffered some form of abuse (emotional, physical or sexual) in early life or are presently in abusive relationships [8, 9].

Women in the fourth decade of life appear to have worse symptoms, and the severity of the disease tends to worsen with increasing age up until menopause. There is also an increased risk of hypertensive disorders in affected patients later in life.

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There is evidence of genetic predisposition to the disease as women whose mothers suffered from PMS are at higher risk of having the disease, and also monozygotic twins have a 93% rate of PMS compared with 44% in dizygotic twins [9]. Symptoms also vary with race; while black women often experience a higher prevalence of food cravings than white women, the white women often experience a higher prevalence of mood swings and weight gain [10].

Obesity and smoking have also been identified as risk factors for this condition. Women with body mass index more than 30, are three times more likely to have PMS than non-obese women and women who smoke are more than two times likely to present with severe symptoms [10, 11].

3. Clinical presentation

PMS symptoms tend to occur in a cyclic pattern from ovulation to onset of menstruation. Symptoms could be physical, psychological/emotional, environmental and/or behavioral [12, 13]. Over 200 symptoms have been described. Symptoms and signs tend to affect a patient's ability to perform normal daily activities and adversely affect their interpersonal relationships. Occasionally it results in violence in the home and broken marriages as well as loss of a woman's economic means in society. In a focus group discussion carried out among women attending a tertiary health facility in Southern Nigeria, premenstrual syndrome was viewed as a curse because of its myriad of symptoms.

Physical symptoms include the following:

Headaches

Acne

Breast tenderness

Abdominal bloating

Diarrhea or constipation

Joint and muscle pains

Fatigue

Weight gain (from fluid retention)

Swelling of the extremities

Dysmenorrhea

Change in bowel habits

Frequent urination

Hot flashes or cold sweats

General aches or pains (malaise)

Nausea and vomiting

Allergic reactions

Upper respiratory tract infections

Palpitations

Unusual food cravings

Low tolerance for noise, odors or light

Psychological/emotional symptoms include the following:

- Anxiety symptoms such as:

  Difficulty sleeping

  Tense feelings

  Irritability

  Clumsiness

  Mood swings

  Panic attacks

  Paranoia

- Depressive symptoms such as:

  Depressed mood and affect

  Angry feelings for no reason

  Feelings that are easily upset

  Poor concentration

  Memory loss

  Feelings of low self-worth

  Violent feelings and/or action

  Crying spells

  Social withdrawal

  Changes in appetite

  Changes in libido

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Mental health disorders are worsened or exacerbated by PMS. These include depression and anxiety disorders. Other medical conditions whose symptoms may be worsened by PMS include; myalgic encephalomyelitis or chronic fatigue syndrome, irritable bowel syndrome and bladder pain syndrome. Health problems such as asthma, allergies and migraines may also worsen with this disease. Patients with PMS may also experience heavy menstrual bleeding and early menopause.

4. The pathophysiology of premenstrual syndrome

The exact cause of premenstrual syndrome is unknown and is the subject of much ongoing research. Several theories have been proposed; from sex hormones interactions to neurotransmitters interactions in the central nervous system. Older theories that have proven to be incorrect include estrogen excess or withdrawal, progesterone deficiency (these were the initial sex hormones theories), pyridoxine (vitamin B6) deficiency, alteration of glucose metabolism, fluid-electrolyte imbalances. Current research provides some evidence supporting the following etiologies:

4.1. Sex hormone

Symptoms of premenstrual syndrome begin following ovulation and resolve with menses, and because they only affect women in reproductive age, it is assumed that the female gonadal hormones (estrogen and progestogen) have a role in the pathophysiology of the disease. This is underscored by the facts that symptoms are less common in women with surgical oophorectomy or drug-induced ovarian hypofunction, such as with gonadotropin-releasing hormone (GnRH) agonists. Moreover, women with anovulatory cycles rarely report PMS symptoms. For these reasons, research of PMS pathophysiology has focused on the sex steroids, estrogen and progesterone. However, no propounded theory so far has borne fruit.

4.2. Serotonin deficiency

It is postulated that patients with PMS suffer from lower serotonin level in the luteal phase, which may or may not be as a result of the various interactions of the sex hormones. It has been proven that patients most affected by symptoms of PMS have differences in serotonin levels when compare to others. This evidence supports a role for serotonergic system dysregulation in the pathophysiology of PMS. Moreover, trials of serotonergic treatments have shown symptom reduction in women with PMS, symptoms respond to selective serotonin reuptake inhibitors (SSRIs), which increase the levels of circulating serotonin.

4.3. Central nervous system interaction

Estrogen and progesterone are neuroactive steroids and influence the central nervous system (CNS) neurotransmitters: serotonin, noradrenaline, and γ-aminobutyric acid (GABA). The predominant action of estrogen is neuronal excitability, whereas progestogens are inhibitory. Women with PMS have exaggerated responses to normal levels of these hormones, and rapid

changes in the levels of these hormones as is experienced in the luteal phase of the menstrual cycle promote the development of symptoms.

4.4. Nutrient deficiencies

Magnesium and calcium deficiencies have been hypothesized to be causes of PMS symptoms. Studies evaluating supplemental therapies have shown improvement in symptoms.

4.5. Psychosocial theory

The psychosocial theory postulates that PMS is a conscious demonstration of a woman's conflict with her femininity and motherhood. It suggests that the premenstrual physical changes remind the woman that she is not fulfilling her traditional role of incubating, nurturing, and rearing a child. This theory is highly subjective and scientifically unprovable.

4.6. Sociocultural theory

The sociocultural theory postulates that PMS is a manifestation of a conflict between the societal expectation of the dual role of a woman as both a productive part of the workforce and a mother. It suggests that PMS is a cultural expression of women's dissatisfaction with their traditional roles in society.

4.7. Cognitive and social learning theory

This theory suggests that the onset of menstrual bleeding is an adverse psychological outcome for some women and PMS is a display of maladaptive coping strategies in other to reduce immediate stress.

5. Diagnosis of premenstrual syndrome

Diagnosis of PMS can often be difficult because may medical and psychological conditions mimic the symptoms, and there are no laboratory tests to confirm the diagnosis. Women with PMS usually present with complaints from multiple systems, and these symptoms display temporal association with the menstrual cycle luteal phase. Symptoms must begin at least 5 days (American College of Obstetricians and Gynecologists [ACOG] criteria) [8] or 1 week (DSM-IV-TR) before menses, and remit within 4 days (ACOG criteria) or a few days (DSM-IV-TR) after menses onset [2]. Evaluation of women complaining of PMS symptoms includes prospective daily symptom rating for at least two or three menstrual cycles.

A menstrual diary could be used to record the onset and duration of symptoms of PMS for 2–3 cycles; this not only helps the physician make the diagnosis but also increases the patient's awareness of her body and moods. She is thus, better at coping with her symptoms. The Endicott Daily Record of Problem Severity chart or the Daily Symptom Rating are tools that can be used to assess the frequency and severity of symptoms described in the luteal phase as against those experienced in the follicular phase of the menstrual cycle [14].

A within-cycle increase from follicular to luteal phase score of at least 20–50% is necessary to confirm a diagnosis of PMS. This 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).

A physical examination may identify some of the physical symptoms and signs of the disease. In certain instances, PMS symptoms may be an exacerbation of underlying primary psychiatric condition(s). Thus, a psychiatric evaluation may help rule out other common psychiatric conditions such as depression, dysthymia, and anxiety disorders. Additionally, other medical conditions that have a multisystem presentation should be considered. These include hypothyroidism, systemic lupus erythematosus, endometriosis, anemia, fibromyalgia, chronic fatigue syndrome, fibrocystic breast disease, irritable bowel syndrome, and migraine. Laboratory studies should include complete blood count, thyroid function tests and gynecological hormone profile.

6. Premenstrual dystrophic disorder (PMDD)

This is a condition in which a woman has severe depressive symptoms, tension and irritability before menstruation. It is a more severe form of PMS that affects a small percentage of women within reproductive age resulting in remarkable disability and loss of function. Symptoms are of sufficient severity as to interfere with work or school, social activities, interpersonal relationships and quality of life. Patients complain of similar symptoms as seen in PMS but of increased severity. Most symptoms of PMDD are similar to symptoms of a major depressive disorder (MDD). These symptoms, however, are cyclic and disappear with the onset of menses. The most common symptoms of PDMM are irritability, limited concentration, sleep disturbance, mood lability and marked depressed mood. Similarities to MDD are highlighted below.

- Markedly depressed mood. A symptom of MDD is depressed mood most of the day, nearly every day.
- Decreased interest in usual activities. One criterion for MDD is markedly diminished interest or pleasure in all activities.
- Lethargy, fatigability or lack of energy. Similarly, patients with MDD have fatigue or loss of energy.
- Hypersomnia or insomnia—also symptoms of MDD.

7. Diagnosis

The Diagnostic and Statistical Manual of Mental Disorders, 5th edition established 7 criteria for diagnosis of PMDD [2] (A–G).

7.1. Criterion A

In Criterion A in most menstrual cycles during the past year, 5 out of 11 symptoms listed must be present (including one of the first four) in the last 1–2 weeks before the onset of menses and disappear in the week post-menses. These symptoms are as follows:

1. Marked lability (mood swings)
2. Marked irritability or anger
3. Marked depressed mood
4. Marked anxiety or tension
5. Decreased interest in usual activities
6. Difficulty in concentration
7. Lethargy and marked lack of energy
8. Marked change in appetite (overeating or special food cravings)
9. Hypersomnia or insomnia
10. Feeling overwhelmed or out of control
11. Physical symptoms (e.g. breast tenderness, bloating, weight gain or swelling of extremities etc.)

7.2. Criterion B

One of the following symptoms must be present:

1. Marked affective lability
2. Marked irritability or anger or increased interpersonal conflicts
3. Marked depressed mood, feelings of hopelessness or self-deprecating thoughts
4. Marked anxiety tension and/or feelings of being keyed up or on edge.

7.3. Criterion C

One or more of the following symptoms must be present additionally, to reach a total of five symptoms when combined with Criterion B.

1. Decreased interest in usual activities (e.g. work, school, hobbies, friends)
2. Subjective difficulty in concentrating
3. Lethargy, easy fatigability, or marked lack of energy
4. Marked change in appetite (overeating or specific food cravings)
5. Hypersomnia or insomnia

6. Feeling overwhelmed or out of control
7. Physical symptoms (e.g. breast tenderness, bloating, weight gain or swelling of extremities)

Note: the symptoms in criteria A–C must be met for most of the menstrual cycles in the preceding year.

7.4. Criterion D

The symptoms are associated with clinically significant distress or interference with work, school, usual social activities or relationship with others (e.g. avoidance of social activities, decreased productivity and efficiency at work, school, or home).

7.5. Criterion E

The disturbance is not merely an exacerbation of the symptoms of another disorder, such as a major depressive disorder, panic disorder, persistent depressive disorder (dysthymia) or a personality disorder (although it may occur concurrently with any of these disorders).

7.6. Criterion F

Prospective daily ratings during at least two symptomatic cycles should confirm Criterion A. (Note: the diagnosis may be made provisionally prior to this confirmation).

7.7. Criterion G

The symptoms are not attributable to the physiological effects of a substance, (e.g. substance abuse, a medication, or other treatment) or another medical disorder (e.g. hyperthyroidism).

8. Management

8.1. Patient education/counseling

PMS may cause significant distress for patients especially the adolescents and as such providing patients with adequate information on the disease including alternative therapies is imperative. Management of this disorder requires a multi-disciplinary approach involving the general practitioner, the general gynecologist or a gynecologist with particular interest in PMS, a mental health professional (psychiatrist, clinical psychologist or counselor), physiotherapist and dietician.

8.2. Life style and dietary changes

Treatment of PMS is majorly according to the severity of symptoms [8, 12, 13, 15]. Regular exercise and dietary restrictions often reduce symptoms. Obese patients should be encouraged to join a weight management program. Dietary modification is often a part of the overall treatment regime. Patients are encouraged to consume smaller meal portions high in carbohydrates. Patients should be counseled to avoid salt, caffeine, alcohol and simple or refined

sugars. Exercise and physical activities cause a release of endorphins which improve general health, nervous tension and anxiety.

8.3. Behavioral anger and stress management therapies

This may help patients cope and or regain control during times of heightened emotions. A variety of methods may be employed. These include; emotional support from family and friends, individual and couples' therapy, self-help support groups, anger management courses, stress management classes, as well as cognitive-behavioral therapy. Our clients described emotional support from family and friends as very helpful. Relaxation techniques such as yoga, biofeedback and self-hypnosis are also be helpful.

8.4. Supplements

These include but are not limited to calcium and magnesium supplements, vitamin E and B6, and polyunsaturated fatty acids (omega-3 and omega-6). Some alternative medicines/herbal supplements have been used to ease PMS symptoms with varying reports of success. These include; Black cohosh, Chaste berry (or vitex agnus-castus), Evening Primrose oil, St John's Wort and Dandelion. Research has shown that for these remedies to be effective, they need to be taken for at least two consecutive cycles. However, some of these remedies may be toxic and cause liver damage at high doses.

8.5. Medications

Various medications have been used to address the moderate to severe symptoms of PMS including:

Diuretics: These are often given to eliminate excess fluid. For example, spironolactone is widely used to treat swelling of the hands, feet and face.

Hormonal therapies: Some women benefit from combined oral contraceptives. The newer formulations (drospirenone-containing COCPs) control the fluctuations of the sex hormones reducing symptoms of PMS. The Mirena Intrauterine System releases low doses of progesterone and suppresses ovulation reducing the symptoms of PMS; however, it may initially induce PMS-like symptoms. Depo-Provera has a similar mechanism of action. Percutaneous estradiol combined with cyclical progestogens has been found to be useful in managing both physical and psychological symptoms of PMS.

Gonadotrophin-releasing hormone (GnRH) analogues and agonists: These are ovarian hormone suppressors, by suppressing the release of the sex hormones from the ovaries, they reduce the symptoms of PMS. GnRH analogues are highly effective in treating symptoms of severe PMS. An example of a GnRH analogue is danazol, and a GnRH agonist is goserelin. However, use of these therapies for greater than 6 months is associated with increased risk of osteoporosis and irreversible virilizing effects; therefore, in women receiving GnRH analogues for more than 6 months, add-back hormone therapy should be given. COCPs should be given or tibolone is recommended.

Analgesics and anti-prostaglandins: These are commonly used to treat menstrual cramps, headaches, breast tenderness and pelvic discomfort. Non-steroidal anti-inflammatory drugs like ibuprofen, naproxen and mefenamic acid have been very useful. However, long-term use may predispose patient to gastric ulcers.

Antidepressants: These increase levels of neurotransmitters and excitatory chemical in the brain (e.g. serotonin, GABA, opioids). They help treat mood disturbances associated with PMS. Examples include; fluoxetine and paroxetine.

Selective serotonin reuptake inhibitors (*SSRIs*) *and selective noradrenaline reuptake inhibitors* (*SNRIs*): These are mood stabilizers with antidepressant effects. There increase the levels of serotonin and noradrenaline in the brain, both of which tend to decrease in the luteal phase in women with PMS.

8.6. Bilateral oophorectomy

In extreme cases, especially when the patient's quality of life is affected as seen in PMDD, and knowing the disease worsen with age, patients may be counseled for a bilateral oophorectomy and hysterectomy. This is especially recommended for patients who have completed their reproductive careers or patients who have severe symptoms unresponsive to all other therapies. It, however, tilts the women into early menopause with its problems as such hormone replacement therapies (HRT) should be considered. Bilateral oophorectomy without removal of the uterus will necessitate the use of a progestogen as part of HRT which carries the risk of PMS-like symptoms.

9. Conclusion

Premenstrual syndrome is a disease very prominent among women of reproductive age. It is not to be dismissed, taken for granted or treated with skepticism. There are therapies to end the sufferings of affected women. It is essential that we treat these women in other to promote their health, the health of the family and to sustain the economic productivity of women in our communities.

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