

AMERICAN SOCIETY FOR REPRODUCTIVE MEDICINE
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PREMENSTRUAL SYNDROME (PMS)

A Guide for Patients



PATIENT INFORMATION SERIES

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A glossary of italicized words is located at the end of this booklet.

INTRODUCTION

Premenstrual syndrome (PMS) is a common endocrine (hormonal) disorder characterized by the appearance of physical and/or psychological symptoms specifically prior to the onset of menstruation. Although PMS is relatively easy to diagnose and most women can be successfully treated, the specific factors that cause its development remain poorly understood. The goals of this booklet are to define and explain the causes of PMS, address its relationship with other illnesses, and review its medical management.

DIAGNOSIS

Premenstrual syndrome refers to the occurrence during the *luteal phase* (second half) of the menstrual cycle of a cluster of physical, psychological, and behavioral symptoms that interfere with life activities. There are three important components to PMS: it is cyclic; symptoms occur in the luteal phase of the menstrual cycle during and/or after *ovulation*; and symptoms must be severe enough to interfere with some aspect of daily life.

The most common symptoms associated with PMS are listed in Table 1 and can be categorized as emotional, behavioral, or physical. The majority of women (58 percent) report having both emotional and physical symptoms. Fewer women (37 percent) seek care because of distressing emotional symptoms while having minimal physical symptoms. Only 5 percent seek medical care because of distressing physical symptoms with absent or mild emotional symptoms.

TABLE 1: Common PMS Symptoms

| EMOTIONAL | PHYSICAL | BEHAVIORAL |
|------------------|-----------------------------|----------------------------|
| Anxiety | Headaches | Food cravings |
| Irritability | Migraines | Increased appetite |
| Unstable moods | Breast tenderness | Increased alcohol intake |
| Depression | Swelling of the extremities | Decreased motivation |
| Anger | Bloatedness | Decreased efficiency |
| Sadness | Fatigue | Avoidance of activities |
| Crying easily | Abdominal cramps | Staying at home |
| Nervous tension | Aches and pains | Sleep changes |
| Oversensitivity | Weight gain | Libido changes |
| | Skin problems | Reduced cognitive function |
| | Hot flashes | Social isolation |
| | Gastrointestinal symptoms | Poor concentration |
| | Dizziness | Forgetfulness |
| | Palpitations | |

Ninety percent of all menstruating women report having some symptoms that are associated with PMS; however, most do not have PMS. Between 20 and 40 percent of reproductive aged women have premenstrual symptoms which may interfere with some activities. Of women with premenstrual symptoms, only 2 to 5 percent are incapacitated with severe symptoms, and these are defined as having PMS.

Any woman of reproductive age (from puberty to menopause) can experience PMS. Although 30- to 40-year-old women are most commonly diagnosed with PMS, the actual frequency of this condition is similar in adolescent females and older women. Women who have had a hysterectomy but retain their ovaries can also have PMS.

The most important tools for diagnosing PMS are daily symptom calendars and rating scales (Figure 1). There is often a discrepancy between recalled data (what patients remember) and what actually occurs. It is important, therefore, that PMS be diagnosed using some form of daily symptom recording that can be analyzed at the end of the cycle. The diagnosis is confirmed after several months of symptom recording, which also allows the physician to evaluate the specific type of symptoms experienced by each individual patient. Psychological questionnaires and rating scales are utilized by some centers, particularly those conducting research, and are useful in evaluating women who may be experiencing emotional problems other than PMS.

Conditions that have similar symptoms to PMS include chronic psychiatric mood disorders that worsen in the premenstrual period. Examples of such disorders include depression, anxiety, and panic disorder. The main feature distinguishing

PMS from psychiatric problems is that in PMS, the symptoms only appear after ovulation every month. It is important to distinguish PMS from other disorders, as the treatment varies based on the diagnosis.

CAUSES OF PMS

Many theories have been proposed to explain PMS but none have been proven. Current research is focusing on the relation between hormones and physical and psychological responses. Ovulation triggers the symptoms called PMS, but PMS cannot be explained by ovarian hormone abnormalities alone. In fact, the blood levels of all hormones are similar in PMS patients and unaffected healthy women. Nonetheless, it is possible that ovarian hormones interact differently with the brain in women with PMS, leading to the appearance of symptoms.

Nutritional factors such as high fat diets, excess alcohol, sweets, salt, and caffeine may increase vulnerability to PMS. Excessive stress, a history of sexual, physical, and/ or emotional abuse, *menorrhagia* (heavy menstrual bleeding), and/or pelvic pain may make some individuals more susceptible to disabling premenstrual symptoms.

MANAGEMENT OF PMS

The goal of therapy is to reduce the severity of symptoms so that they no longer interfere with a woman's psychosocial and physical functioning. Education, support, nutritional control, stress reduction, and exercise are self-help measures that may provide satisfactory improvement in symptoms in up to 30 percent of women with PMS. A wide variety of health care personnel can teach stress reduction methods, coping skills, and improved sleep habits.

Nutritional modifications may help up to 30 percent of patients. Well-balanced meals with low fat, sugar, and salt intake and adequate protein, fiber, and complex carbohydrates can be helpful. Caffeine and alcohol should generally be avoided. Several studies have suggested that 1,000 mg of calcium supplementation daily may help to reduce physical and emotional symptoms. Magnesium supplementation has also been shown to help reduce water retention and mood symptoms. Vitamin B₆ (pyridoxine) has been used with mixed results. In general, low dosages should be used and if there is no improvement within two to three months, the vitamin B₆ should be stopped because it may adversely affect nerve function. Vitamin E has also been shown to benefit some PMS symptoms. However, nutritional therapy alone generally does not result in a consistent improvement in PMS symptoms in all women.

Medical Management

Diuretics can be used to reduce the symptoms associated with water retention for women who have a documented premenstrual gain in weight noted on their symp-

tom calendar. The most effective way to use diuretics is to start the medication one or two days before the expected onset of water symptoms and continue the therapy until menstruation occurs.

Nonsteroidal anti-inflammatory medications (NSAIDs) such as ibuprofen can be used to help reduce the pain-related symptoms of PMS. However, NSAIDs may interact with some diuretics and cause kidney problems. Caution should be used when combining these medications.

Several psychiatric medications such as alprazolam (Xanax®) have been proven effective in treating the emotional symptoms of PMS. Alprazolam belongs to a category of drugs known as *benzodiazepines* and has anti-depressant and smooth muscle relaxant properties. Small dosages of alprazolam are taken only during the luteal phase of the cycle and then decreased during the menstrual flow. The risks of addiction are minimized when used in this manner in low dosages (generally not exceeding 0.75 mg daily). Because of its potential for addiction, alprazolam is generally not recommended for women who have a history of drug or alcohol abuse. Women on this medication should be monitored very closely by their physician.

Fluoxetine (Prozac®) has been shown to relieve the emotional symptoms, particularly depression, and appetite cravings associated with PMS. However, it is not effective in reducing physical symptoms. In contrast to alprazolam, which is given only during the luteal phase of the menstrual cycle, fluoxetine is generally given every day of the month. The usual dosage is 20 mg. daily, although higher or lower dosages may be needed at different times in the cycle. The most common side effects of fluoxetine are anxiety, nervousness, insomnia, loss of appetite, weight loss, and a decrease in *libido* and the ability to have orgasms.

Other drugs such as buspirone (Buspar®) and clomipramine (Anafranil®) have been used successfully to reduce the fat and sugar cravings associated with PMS.

Suppression of Ovulation

Oral contraceptives, commonly known as birth control pills, *estrogens*, and *medroxyprogesterone acetate* have been used to treat PMS. Although these medications can inhibit ovulation, there is little medical evidence showing their usefulness for the treatment of PMS.

At one time, inadequate progesterone production was considered the cause of most PMS. Nonetheless, natural progesterone therapy has never been shown to be more effective than a *placebo* for treating PMS. However, although only a few women with PMS will improve with progesterone therapy, it may be prescribed on a trial basis before moving on to other treatments.

Danazol is a medication that is FDA approved for the treatment of *endometriosis*. When danazol is given in a dose high enough to inhibit ovulation, it may effectively treat PMS. Side effects of danazol include oily skin, weight gain, and some cosmetically undesirable hair growth. Although the dosages used for PMS are one-half to one-quarter of those used for the treatment of endometriosis, the duration of therapy is many months longer. To reduce side effects, danazol has been given in the luteal phase of the menstrual cycle with some success.

GnRH agonists are medications used for the treatment of endometriosis and *uterine fibroids*. These medications suppress secretion of the *pituitary gland* hormones *follicle stimulating hormone (FSH)* and *luteinizing hormone (LH)* and cause the ovaries to stop producing estrogen. This prevents ovulation and produces menopause-like symptoms. Improvement in PMS symptoms is noted in almost all patients treated with GnRH agonist-induced “medical menopause.” The most common side effects associated with GnRH agonist therapy are hot flushes, headaches, vaginal dryness, and muscle and joint pain. Since more than six months of treatment with this medication may be associated with early onset of bone loss (*osteoporosis*), low dosages of estrogen and *progestin* can be given along with the GnRH agonist therapy to reduce the risks of osteoporosis and relieve the hot flushes and vaginal dryness that occur. In some patients, PMS symptoms will return when estrogen-progestin is added back to GnRH agonist treatment.

COUNSELING FOR PMS

Women with PMS are very vulnerable to a sense of inadequacy, isolation, and shame. Group counseling or structured support groups allow these women to overcome their feelings and obtain support. Relaxation therapy, when used as a self-help measure along with ongoing counseling, may lessen the need for medical management of PMS. It is very important that women who feel depressed seek professional counseling. Depression is very treatable, often with a combination of medication and counseling.

CONCLUSION

Although PMS is poorly understood, it is relatively easy to diagnose and can often be effectively treated. Each woman must be individually evaluated and managed within the context of her lifestyle and medical history. Though medical management of PMS often improves symptoms, some symptoms may not completely disappear. However, the large majority of patients with PMS will respond to treatment with improvement in the quality of their lives.

GLOSSARY

Danazol. An androgen-like drug used to treat endometriosis. Danazol blocks ovulation and suppresses estrogen levels. The brand name is Danocrine®.

Diuretics. A medication or drug that increases urination and the loss of water from the body.

Estrogens. The female sex hormones produced by the ovaries which are responsible for the development of female sex characteristics. Estrogens are largely responsible for stimulating the uterine lining to thicken during the first half of the menstrual cycle in preparation for ovulation and possible pregnancy. They are also important for the maintenance of healthy bones and overall health. A small amount of these hormones is also produced in the male.

FDA. The Food and Drug Administration; the federal agency responsible for evaluating new medications and approving them for commercial use.

Fluoxetine. A psychiatric antidepressant medication belonging to the class of compounds that increase brain serotonin levels by blocking reuptake. Serotonin is a chemical associated with mood regulation. The brand name of fluoxetine is Prozac®.

Follicular phase. The first half of the menstrual cycle (beginning on day one of bleeding) during which the dominant ovarian follicle, which contains an egg, grows, matures, and secretes large amounts of estrogen in preparation of ovulation.

Follicle stimulating hormone (FSH). In women, FSH is the pituitary hormone responsible for stimulating follicular cells in the ovary to grow, stimulating egg development and the production of the female hormone estrogen. In men, FSH is the pituitary hormone which travels through the bloodstream to the testes and helps stimulate them to manufacture sperm. FSH can also be given as a medication. The brand name is Metrodin®.

GnRH agonists. Synthetic hormones similar to the naturally occurring gonadotropin releasing hormones (GnRH) secreted by the hypothalamus. GnRH agonists, when given in short pulses, stimulate FSH and LH production by the pituitary gland. However, when given in more prolonged doses, it decreases FSH and LH production by the pituitary, which in turn decreases ovarian hormone production and produces a menopausal-like state. Brand names are Lupron®, Synarel®, and Zoladex®.

Luteinizing hormone (LH). In women, LH is the pituitary hormone that triggers ovulation and stimulates the corpus luteum of the ovary to secrete progesterone and estrogen during the second half of the menstrual cycle. In men, LH is the pituitary hormone which stimulates the testes to produce the male hormone testosterone.

Libido. Sexual drive and desire.

Luteal phase. The second half of the menstrual cycle after ovulation when the corpus luteum (tissue formed in the ovary from a mature follicle that has released its egg at ovulation) secretes large amounts of progesterone. This progesterone is important in preparing the lining of the uterus to receive an embryo for implantation.

Medroxyprogesterone acetate. A medication that mimics the effects of natural pro-

gesterone. Brand names are Provera® and Depo-Provera®.

Menorrhagia. Regular but heavy menstrual bleeding which is excessive in either amount (greater than 80 cc - approximately five tablespoons) or duration (greater than seven days).

Oral contraceptives. Also known as birth control pills. The pills contain a mixture of synthetic estrogen and progestin. Proper usage prevents pregnancy by suppressing ovulation and decreasing production of hormones by the ovaries.

Ovulation. The release of a mature egg from its developing follicle in the outer layer of the ovary. This usually occurs approximately 14 days preceding the next menstrual period (the 14th day of a 28-day cycle).

Placebo. A medication which has no real effect; given to patients in studies when testing if a real medication is needed. Often called “sugar pills,” placebos may also be given as shots that contain only water.

Progesterone. A female hormone secreted by the corpus luteum after ovulation during the second half of the menstrual cycle (luteal phase). It prepares the lining of the uterus (endometrium) for implantation of a fertilized egg and also allows for complete shedding of the endometrium at the time of menstruation. If pregnancy occurs, the progesterone level remains stable beginning a week or so after conception.

Progestin. A synthetic hormone that has an action similar to progesterone.

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AMERICAN SOCIETY FOR REPRODUCTIVE MEDICINE

Formerly The American Fertility Society

1209 Montgomery Highway

Birmingham, Alabama 35216-2809

(205) 978-5000