

Premenstrual Syndrome: The Role of Nutrition, Supplementation and Chiropractic in PMS Management

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An increasing number of women suffering from premenstrual syndrome (PMS) are seeking help from complementary and alternative health practitioners. Surveys indicate that women choosing alternative therapies have generally found them to be effective.¹ As such, the health care community should be familiar with the efficacy of various evidence-based natural interventions. A recent survey showed that 42 percent of women suffering from PMS take prescription or over-the-counter (OTC) medications to relieve their symptoms. In this group, 80 percent were using OTC medication, primarily to control pain.¹ The emerging evidence suggests that PMS sufferers may reduce their reliance upon synthetic drugs by adopting specific dietary modifications, taking certain vitamins and minerals, herbal and essential fatty acids, and undergoing chiropractic or acupuncture treatments.

The Premenstrual Syndrome

PMS is a recurrent, variable cluster of troublesome physical and emotional symptoms that develops from seven to 14 days before the onset of menses, and subsides when menstruation occurs. Approximately one-third of all premenopausal women are affected, primarily those 25-40 years of age. In about 10 percent of affected women, the syndrome may be recurrent and severe.²

Symptoms can be classified as:

Behavioral (nervousness; anxiety; irritability; mood swings; fatigue; lethargy; or depression).

Gastrointestinal (abdominal bloating; diarrhea or constipation; or appetite changes with cravings for such foods as sugar, salt or chocolate).

Reproductive Tissue (breast tenderness and swelling; uterine cramping; or altered libido).

Other (headache; backache; acne; ankle and finger swelling).³

Though not every woman experiences all the symptoms or signs at one time, many consistently complain of bloating; breast pain; ankle swelling; a sense of increased weight; skin disorders; irritability; aggressiveness; depression; libido changes; lethargy; and food cravings.²

Causative Factors

One of the underlying factors linked to PMS is an elevated estrogen-to-progesterone (E-P) ratio five to 10 days prior to menses. This can arise from excess estrogen synthesis; decreased estrogen clearance (liver detoxification of circulating estrogen); or reduced secretion of progesterone from the *corpus luteum*. (After ovulation, the *corpus luteum* is formed in the ovaries, which secretes

progesterone. If fertilization does not take place, it shrinks and progesterone secretion drops off, until approximately day 14 of the next menstrual cycle, when a new corpus luteum is formed in the ovaries.)⁴⁻⁶ Typically, this derangement is caused by a combined mild estrogen excess and mild progesterone deficiency.²

Evidence exists to show that an elevated E-P ratio is associated with a decline in brain endorphin levels, which likely contributes to mood swings in PMS. Brain endorphin levels are also known to increase the feeling of psychological well being.^{5,7}

Elevated estrogen is also known to adversely affect vitamin B₆ levels, which are often low in depressed patients, especially those taking estrogens (birth control pills or estrogen replacement therapy).^{8,9} At the same time, studies reveal that B₆ can improve many symptoms of PMS.^{10,11} Excess estrogen may also give rise to elevated levels of prolactin hormone, implicated in breast pain and fibrocystic breast disease.^{12,13}

Elevated estrogen may also result in higher levels of aldosterone, the hormone that increases sodium and water retention.³ Thus, an elevated E-P ratio has been shown to alter endorphin, neurotransmitter (brain chemicals) prolactin and aldosterone levels, which contribute to many of the psychological and physical symptoms of PMS.³

Other researchers suggest that PMS patients show a difference in how the central nervous system responds to normal variations in estradiol and progesterone compared to non-PMS sufferers. Cyclic hormonal fluctuations can alter brain neurotransmitters or peptides, leading to PMS in biologically susceptible women.¹⁴ Particularly interesting is that PMS sufferers have been shown to have lower whole blood serotonin concentrations and decreased platelet uptake of serotonin than non-PMS sufferers.^{15,16} Reduced serotonergic neurotransmission has been linked with depressed mood; irritability; anger; aggression; poor control of impulses; and an increased craving for carbohydrates.¹⁷ As a result, some women have responded well to treatment with selective serotonin re-uptake inhibitor drugs such as Prozac, which increases brain concentrations of serotonin.¹⁸ However, not all women respond to this therapy, and other neurotransmitters also appear to be aberrant in PMS, including opioid, catecholaminergic and gamma-aminobutyric acid systems.¹⁹

In recent years mainstream practitioners have acknowledged that various nutrient deficiencies and dietary patterns may play a central role in the cause of menstrual discomfort. The mainstream literature now cites deficiencies in calcium; magnesium; manganese; B-vitamins; vitamin E; and gamma linolenic acid as being linked to PMS. A high-sugar diet, and the consumption of large amounts of caffeinated beverages or alcohol have also been identified as factors that contribute to PMS. In this regard, a number of clinical studies have shown that certain nutrition and supplementation interventions can be effective in the management of PMS, and should be considered in the overall treatment plan.²⁰

Correcting the Estrogen-to-Progesterone Ratio Naturally

A number of dietary, lifestyle and supplementation practices have been shown to improve the estrogen to progesterone ratio and provide relief to women who suffer from PMS:

1. A low-fat, high-fiber diet can help reduce circulating estrogen levels. Vegetarian women,

known to have higher intakes of fiber, excrete two to three times more estrogen in their feces and have 50 percent lower levels of free estrogen in their blood than omnivores.^{21,22} Other studies reveal that when women lowered their fat intake from 40 to 25 percent of their total calories, and increased their fiber consumption from 12 to 40 grams per day, there was a 36 percent reduction in blood estrogen levels. A low-fat diet alone has also been shown to relieve PMS symptoms.²³⁻²⁵

2. Exercise has also been shown to have a favorable modifying influence on PMS frequency and severity. Several studies demonstrate that women who engage in regular exercise programs do not suffer from PMS nearly as often as sedentary women. In addition to lowering free-estrogen blood levels, exercise also raises brain endorphin levels, improving mood and reducing anxiety and feelings of depression.²⁶⁻²⁸
3. Specific dietary supplements have proven value in normalizing the estrogen to progesterone ratio and markedly improving PMS frequency and severity:

Black cohosh contains triterpene or saponin compounds that serve as natural building blocks of progesterone synthesis. It is the only known natural substance that can raise blood progesterone levels. Additionally, black cohosh triterpenes help to block the effects of excess estrogen on breast tissue and the uterus, toning down the PMS-promoting impact on these tissues. Studies of women with PMS reveal that the standardized grade of black cohosh can improve PMS symptoms when taken at a daily dosage of 40 or 80 mg twice daily (2.5 percent triterpene content).^{29,30}

Other botanical substances have been shown to reduce PMS symptoms, such as angelica species (*dong quai*), red clover, and licorice root. However, it should be noted that these contain coumarins, and thus predispose patients to photosensitivity-induced dermatitis and internal bleeding disorders. They are both contraindicated with concurrent use of any anticoagulant (including aspirin), and reports of bleeding disorders in humans appear in the scientific literature in reference to the use of angelica species. As well, the active ingredients in licorice are known to cause high blood pressure.^{31,32}

Overall, black cohosh offers a safe and effective natural approach to the treatment of PMS. It has no well-known drug-nutrient interactions, with few and minimal side effects reported. Black cohosh has even been shown to provide antispasmodic and pain relief in PMS sufferers.²¹

Chasteberry is another herbal agent that has proven value in the treatment of PMS as a further option. The usual daily dosage is 175-225 mg (0.5-percent agnuside content).^{33,34}

Soy isoflavones have been shown to tone down the effects of the body's estrogens. Soy isoflavones act as phytoestrogens (plant-based estrogens), which can attach to estrogen receptors on the breast, endometrium and other tissues. As such, they can partially block the entrance into these tissues of the body's estrogens, helping to reduce estrogen overstimulation to the breast and uterine tissues. Soy isoflavonoids also enhance estrogen detoxification by the liver and slow down the synthesis of estrogen by inhibiting estrogen synthase enzyme (aromatase) in adipose tissue. Through these mechanisms, the ingestion of 45-75 mg per day of soy isoflavonoids has demonstrated therapeutic benefits in the management of menopausal symptoms, bone density support and modulating female reproductive health, including menstrual cycle

regulation.³⁵⁻³⁸

B-vitamins - More than a dozen double-blind clinical trials suggest that vitamin B₆ supplementation is useful in the treatment of PMS. Vitamin B₆ is a co-factor in estrogen detoxification in the liver, a co-factor in the synthesis of mood elevating neurotransmitters (brain chemicals), and a co-factor in the formation of anti-inflammatory prostaglandin hormones. In some of these applications, Vitamin B₆ works synergistically with other B-vitamins, such as niacin, folic acid, and vitamins B₁₂ and B². Thus, it is likely best to use a B-50 complex as a more comprehensive B-vitamin approach to the management of PMS.^{10,11} Some studies suggest that vitamin B₆ taken in conjunction with 300-400 mg of magnesium per day is beneficial in PMS management.³⁹ Vitamin B₆ works with magnesium in many enzyme systems, and thus are considered to be synergistic nutrients with proven value in the treatment of PMS.⁴⁰

Vitamin E - Double-blind studies suggest that vitamin-E supplementation at 400 I.U. per day can reduce various symptoms of PMS, including nervous tension; headache; fatigue; depression; insomnia; breast tenderness; anxiety; and food cravings. Vitamin E is known to modulate prostaglandin hormone synthesis, and directly affects cellular differentiation (maturation) and proliferation rates (cell division rate) of breast and other epithelial tissues.⁴¹⁻⁴⁵ Vitamin E supplementation (400-600 I.U. per day) has also been shown to help regulate circulating hormones in PMS and fibrocystic breast disease.^{42,46}

Calcium - One large, well-designed, multicenter trial found that 1,200 mg of elemental calcium per day was effective in reducing depression; water retention; pain; food craving; fatigue; and insomnia in women with PMS.⁴⁷

Magnesium - At doses of 200 to 400 mg per day, magnesium has been shown to be helpful in relieving PMS symptoms. One hypothesis is that magnesium may reduce PMS through its effects on the regulation of serotonin and other neurotransmitters.⁴⁸⁻⁵⁰

Manganese - One small study indicated the PMS sufferers with increased mood and pain scores had low manganese status. The dose for supplementation should not exceed six mg per day according to experts in this area. The RDA for manganese is 1.8 mg.⁵¹

Evening primrose oil - There is evidence that supplementation with evening primrose oil may be beneficial in the management of PMS due to its content of gamma linolenic acid, which is reported to be low in the cell membranes of PMS sufferers. Gamma linolenic acid is a precursor to the production of prostaglandin series-1, which has anti-inflammatory effects and may thereby be of benefit in the management of PMS.^{52,53} However, some studies have demonstrated the effectiveness of evening primrose oil in these cases.⁵⁴⁻⁵⁶

A number of small clinical studies have demonstrated that the combination of chiropractic manipulation and soft tissue therapy is an effective intervention in the management of various PMS symptoms, primarily regarding the relief of associated back pain, abdominal cramping and dysmenorrhea.⁵⁷⁻⁵⁹ In a multicenter; prospective; randomized; placebo-controlled; crossover clinical trial involving 25 subjects with diagnosed PMS (using a Moos' Premenstrual Questionnaire, plus daily symptom monitoring), a statistically significant improvement in PMS symptoms was noted in the group receiving adjustments and soft tissue therapy from a chiropractor. In this study the treatment frequency was two to three times in the week before menses for at least three consecutive menstrual cycles.⁵⁷

A single case study in a patient with dysmenorrhea demonstrated that chiropractic adjustments, along with soft tissue therapy, reduced pain ratings (using a pain diary) over a four-month period.⁵⁸ In the study by Walsh, 54 subjects with diagnosed PMS, and 30 subjects with no diagnosable PMS underwent a complete chiropractic examination by one of two selected chiropractors, each with a minimum of 10 years experience. The PMS group was shown to have a higher percentage of positive responses for each of the 12 measured spinal dysfunction indices, except range of motion of the low back. The indices where the increase was statistically significant were cervical; thoracic; and low back tenderness; low-back orthopedic testing; low back weakness; and the neck disability index. An average of 5.4 of the 12 indexes were positive for the PMS group, compared with 3.0 for the non-PMS group. The researchers concluded that a relatively high incidence of spinal dysfunction existed in PMS compared to non-PMS sufferers, which may suggest that spinal dysfunction could be a causative factor, and that chiropractic manipulative therapy may offer an alternative therapeutic approach for PMS sufferers.⁵⁹

Several small trials and patient surveys indicate that acupuncture treatment may also be beneficial as an intervention to reduce painful menstruation and related PMS symptoms.^{1,60,61}

Summary

In many cases, PMS can be managed naturally through dietary modification, exercise, and nutritional supplementation. Some of the recurring abdominal cramping and pain is also responsive to chiropractic care and acupuncture. With respect to dietary and supplementation practices, the following practical recommendations simplify the daily course of action to be considered by PMS sufferers:

1. Eat less animal fat.
2. Consume more grain fiber (wheat bran, psyllium) and vegetables (especially cruciferous vegetables, such as cabbage, cauliflower, broccoli and Brussels sprouts).
3. High-potency multivitamins and minerals - containing a B-50 complex, vitamin E (400 I.U.) from natural sources, magnesium (200-300 mg), calcium (500 mg), and all vitamins and minerals from "A to zinc."
4. Black cohosh - 80 mg, once or twice per day (2.5 percent triterpene content).
5. Soy extract - 500 mg per day (10 percent isoflavones), yielding 50 mg of isoflavones.
6. Supplement diet with other soy-based foods: soy milk, soy cheese, veggieburgers, etc.
7. Some patients may benefit from the addition of a calcium-magnesium supplement containing

500 mg of calcium and 200 mg of magnesium, in addition to the high-potency multivitamins and minerals described above.

8. Evening primrose or flaxseed oil - 2000-3000 mg per day.

Finally, it appears to be beneficial to encourage PMS patients to participate in an aerobic-based exercise program three to six times per week for 20-45 minutes per session (on average), and to have the spine and pelvis checked by a doctor of chiropractic in cases where abdominal pain and cramping is a recurring PMS symptom.

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