



## Nutritional Protocol for Endometriosis

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### Abstract

Endometriosis is a debilitating disease affecting approximately one out of every ten women. Not only does it cause pain during menstruation and intercourse, but it can infertility problems. The current medical treatment involves surgery to remove the endometrial tissue found outside of the uterus along with medications. There are several factors that have been identified as contributing factors. Use of natural alternative to conventional medical treatments can be helpful in mitigation the environmental and dietary factors that contribute to the severity of the disease.

**Keywords:** *Endometriosis; Endometrioma; Xenoestrogens; CA 125*

Endometriosis is characterized by dysmenorrhea (painful menses), dyspareunia (painful intercourse), and infertility. Additional finding can include fixed pelvic structures, a uterus that is tipped backwards and rigid, adhesions in the pelvic cavity, tenderness to palpation of the pelvic area, and/or enlarged ovaries. Endometriomas are detected via imaging, as well as laproscopic visualization of endometrial tissue implanted outside of the uterus in the pelvis or abdomen.

It is estimated that 10-15% of menstruating women suffer from endometriosis. The main risk factor is having a mother or sister that also has endometriosis. Additional risk factors include imbalance in estrogens levels, lack of exercise, high fat diet, the use of intrauterine devices. However, the use of Levonorgestrel-releasing intrauterine devices to treat dysmenorrhea and endometriosis with some success [1,2].

There are some emerging theories that increased antigenicity to sperm within the pelvic cavity can also be a risk factor.

There are many environmental factors as well. These include pesticide and herbicide exposure, PCBs, plastics, dioxin, radiation and environmental estrogen (xenoestrogen) exposure, and poor detoxification pathways in the liver. Increased levels of tumor necrosis factor-alpha have been implicated in the development and maintenance of endometriosis [3].

The implantation of endometrial tissue in odd places, such as the brain, lungs, gut and aorta, suggest that the tissue is transported via the lymphatic and blood circulatory systems. Some researchers have proposed that the endometrial tissue is of embryonic origin [4].

Exposure to environmental disruptors of estrogen, such as radiation and dioxin are associated with a higher frequency of endometriosis. Belgium has the highest rates of both dioxin pollution and endometriosis in the world [5,6]. The link between dioxin exposure and endometriosis has been explored in several studies with inconclusive results [7-9].

Estrogen disruptors in the environment include PCBs, pesticides, herbicides, detergents, plastics, and household cleaning products. Significant alterations in sexual development in multiple animal models have been observed. The development of endometriosis as well as other endocrine problems due to exposure to these environmental chemicals in humans has been established as well [10-12].

Immunological alterations have been linked to endometriosis. Increased levels of IL-25, glycodelin-A, IL-6, and IL-8 and well as lower levels of leptin, as well as elevated levels on cytotoxic T cells are just a few of the alterations in the immune system seen in endometriosis [13-15].

There have been several genetic mutations that have been demonstrated to have a positive correlation with endometriosis. Additional hereditary factors include abnormalities in detoxification pathways, and genetic mutations affecting the immune system [16-20].

## **Diagnosis**

Most cases of endometriosis occur not with the onset of menses, but begin later and progressively get worse over several years. The triad of symptoms listed above can also include vomiting, diarrhea, pain with urination and defecation, blood in the stool, bladder or nose, and generalized fatigue. Usually the pain begins as acute pain in the pelvis/abdomen starting a few days before the onset of menses and continuing for a few days, or lasting throughout the month. The pain can be so severe that the patient experiences syncope. The extent of endometrial lesions and intensity of the disease does not always correlate. It seems that the lesions that extend deepest are the ones those that cause the most severe symptoms [21]. Diagnosis of deep infiltrating lesions can be corroborated by elevated CA 125 plasma levels [22]. However, this is a marker for malignancy and uterine fibroids as well.

Enlarged areas of ectopic endometrial tissue (endometriomas) on the ovaries are found in two-thirds of patients with endometriosis. Endometriosis may result in miscarriage and/or infertility. This is thought to be due to excess free radical production due to the disease as well as scarring of the fallopian tubes, unruptured follicles, and adhesions. Transvaginal ultrasound can be useful in determining location, size and consistency of endometriomas. However, the only definite diagnosis is via biopsy via laparoscopy or laparotomy.

## **Diet**

There are several aspects of diet that are implicated in the development and severity of endometriosis. More than likely, there is a combination of factors that lead to its development. There are several dietary principles that have been shown to be beneficial in alleviating and/or ameliorating the symptoms of endometriosis.

Research suggests that a predominately vegetarian diet is helpful in reducing and/or eliminating the symptoms of endometriosis [23]. Reduction of inflammatory foods and incorporating anti-inflammatory foods and supplements have been shown to be helpful in treating endometriosis [24,25]. A high-fat diet has been shown to worsen the symptoms of endometriosis [26].

Enhancing detoxification mechanisms is important for several reasons. Detoxification of estrogen, decreasing free radical load and elimination of xenoestrogens are critical.

Cruciferous vegetables (broccoli, cauliflower, kohlrabi, cabbage, Brussel sprouts) are high in indole-3-carbinol. This compound is especially helpful to metabolize estrogen in the liver. Quercetin, a bioflavonoid found in apples, red wine, cherries, onions, garlic, leeks, citrus, and peppers, is known to stimulate the immune system, act as a powerful antioxidant, has anti-inflammatory properties and inhibits tumor growth. Curcumin, the yellow pigment in turmeric, is widely recognized for its anti-inflammatory benefits and antioxidant activity [27]. It has been shown to regress endometrial lesions in animal models and prevent its development [28]. Isoflavones found in soy, once thought to stimulate the growth of endometriomas, has been found to be beneficial in Japanese women with endometriosis [29]. Flax seeds, and flax seed oil have also been shown to be beneficial. Both the fatty acid alpha-linolenic acid and the lignans found in the oil/seeds have anti-inflammatory effects [30]. Foods that should be eliminated or greatly decreased include sugar, dairy, red meat, alcohol and caffeine. High sugar intake is associated with increase estrogen levels in males in both animal and human models [31,32]. Caffeine intake has been implicated in the development and severity of symptoms in endometriosis [33,34]. However, there are studies refuting the connection between the two [35]. Dioxin exposure is primarily through meat and dairy products [36-38]. While all of the meat and milk samples tested positive for dioxin, they were considered below the acceptable levels. For those suffering with endometriosis, it is best to avoid dioxin contaminated foods.

## **Antioxidants**

Antioxidants, including vitamin C, vitamin E and beta carotene have been shown to have significant positive effects on endometriosis [39-41]. Vitamin C and analogs of vitamin A have been shown to inhibit the growth and regress the size of endometrial cysts [42,43]. Supplementing with vitamin E and n-acetyl cysteine reduced pain related to oxidative stress in endometriosis [44]. Pycnogenol, an extract of pine bark, has been demonstrated to inhibit inflammation, specifically COX 1 and 2 [45]. When combined with oral contraceptives, pycnogenol slowly, but steadily decreases pain scores associated with endometriosis [46].

## Herbal Medicines

Studies support the use of various botanicals to treat dysmenorrhea associated with endometriosis. Fenugreek seeds have been shown to decrease the severity and systemic symptoms [47]. Valerian root has also been demonstrated to reduce the severity of symptoms, effecting the contraction of the myometrium [48,49]. *Vitex agnes castus*, known also as chaste tree, is used traditionally to balance hormone levels. Experimentally, extracts have been shown to decrease luteinizing hormone and prolactin levels while balancing estrogen and progesterone levels [50,51]. *Leonorus japonicas* Houtt, or Chinese motherwort, has been used to treat dysmenorrhea for thousands of years in China. Over 140 chemicals have been isolated, most of them flavones, alkaloids and diterpenes [52]. These chemicals have been shown to have a positive effect on the uterus, relaxing the myometrium and relieving cramps. Additionally, these chemicals have cardioprotective effects, antioxidant and anti-cancer properties. *Taraxacum officinale*, known commonly as dandelion root, works principally on the liver and gall bladder, promoting detoxification pathways [53-55]. Studies have demonstrated anti-cancer activity as well [56,57]. The use of Jiawei-Foshou-San formula, a traditional Chinese formula that combines Chinese Angelica, Szechwan Lovage Rhizome and Rhizoma, has been shown to prevent growth of endometrial tissue and help shrink existing ectopic endometrial tissue in animal models [58]. Other studies support the use of traditional Chinese medicine without exploring the specific mechanism [59,60].

## Essential Fatty Acids

Both alpha-linolenic acid and gamma-linoleic acid are known to decrease inflammation in general by affecting the type of eicosanoids produced, especially prostaglandins and leukotrienes. Oils derived from flax seeds, soy, rapeseed, walnuts and pumpkin are high in alpha-linolenic acid, whereas borage, black currant and evening primrose oils are high in linoleic acid. Animal fats, which are high in arachidonic acid, lead to an increase in inflammation and increased spasmodic activity in endometriosis due to different prostaglandins produced. Intake of linoleic and alpha-linolenic acids are known to positively influence prostaglandin and leukotrienes synthesis. This has been shown to be an effective strategy in treating dysmenorrhea associated with endometriosis [61-63].

## Thiamine (B1)

B1 taken as doses of 100 mg/day has been shown to reduce the symptoms of endometriosis [24,49,64]. There is no known toxicity for thiamine at this dosage.

## Magnesium

Magnesium is a known muscle relaxer. It is used to treat constipation, asthma and hypertension due to its ability to relax smooth muscle. It has also been shown to be effective in treating dysmenorrhea and other symptoms of endometriosis [64,65]. Dosing magnesium is based on the individual's gut physiology. Doses in the range of 400-800 mg/day are usually sufficient, but should be increased to bowel tolerance in severe cases.

## Summary of Supplements

Vitamin E: 400- 800 IU/day (start with the lower dose and then add 400 more after two weeks)

Beta-carotene: 50,000 to 150,000 IU/day (caution with pregnancy- avoid doses over 25,000 IU/day)

Vitamin C: 6000 to 10,000 mg/day in divided doses. Higher doses can cause diarrhea.

Flax seed oil: 3000 mg 3x/day

B1 (Thiamine): 100 mg/day

Pycnogenol: 60-150 mg/day

Tinctures of dandelion root, motherwort, and chaste tree (equal parts- 20 drops each) 3x/day

Magnesium: 400-800 mg/day (or to bowel tolerance)

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