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Protocols

BREAST CANCER

New scientific studies appear regularly on the treatment of cancer. Here, the Foundation publishes an overview on the latest therapies for breast cancer.

While billions of dollars of government research money has been spent fighting breast cancer, the odds are that a shocking one out of eight women will develop the disease.

According to the American Cancer Society, more than 180,000 women will be diagnosed with breast cancer in the coming year, and about 46,000 women will die from it. Breast cancer has become the second largest cause of cancer death in women, after lung cancer, and the leading cause of death for women between 35 and 54. Ever since the "war on cancer" was declared, more women have died of breast cancer than the total number of Americans who lost their lives in World Wars I and II, the Korean War, and the Vietnam War combined.

Clearly, we are in the midst of a breast cancer epidemic. By the time a tell-tale lump is detected in the breast, there already are an average of 45 billion cancer cells present, and some of these malignant cells have metastasized to other parts of the body. Conventional medicine recommends radiation and chemotherapy after the cancerous lump has been removed in an attempt to kill escaped, metastasized cancer cells. An effect of radiation and chemotherapy is the weakening of the immune system. Despite the devastating effects of chemotherapy and radiation therapy to the body, there are studies showing improved survival in breast cancer patients when these conventional therapies are appropriately used.

There are alternative therapies that are crucial to the successful treatment of breast cancer. Breast cancer cells differ from other cancer cells, thus mandating the incorporation of immune-and hormone-modulating therapies that interfere with breast cancer cell proliferation.

One of the most important supplements for the breast cancer patient is high doses of the hormone melatonin at bedtime. Melatonin blocks estrogen receptors somewhat similarly to the drug tamoxifen without the long-term side effects of tamoxifen. Further, when melatonin and tamoxifen are combined, synergistic benefits occur. Melatonin can be safely taken for an indefinite period of time. The suggested dose of melatonin for breast cancer patients is 3 mg to 50 mg at bedtime.

Melatonin not only blocks estrogen receptor sites on breast cancer cells, but directly inhibits breast cancer cell proliferation and boosts the production of immune components that kill metastasized cancer cells.

It should be noted that studies on tamoxifen indicate that after two years, it can cause a significant increase of estrogens in the blood. This may be a mechanism by which cancer cells become resistant to tamoxifen therapy. Since serious side effects of tamoxifen also begin at two years, it may be prudent not to use tamoxifen for more than two years.

Caution: Although melatonin is strongly recommended for breast cancer patients, interleukin-2 (IL-2), which often is combined with melatonin, should be avoided by breast cancer patients. IL-2 may promote breast cancer cell division.

Vitamin A and vitamin D3 inhibit breast cancer cell division and can induce cancer cells to differentiate into mature, non-cancer cells. Vitamin D3 works synergistically with tamoxifen to inhibit breast cancer cell proliferation. Breast cancer patients should take 4,000 to 6,000 IU of vitamin D3 every day on an empty stomach. Water-soluble vitamin A can be taken in doses of 100,000 IU to 300,000 IU every day. Monthly blood tests are needed to make sure toxicity does not occur in response to these relatively high daily doses of vitamin A and vitamin D3. After six months, the doses of vitamin D3 and vitamin A can be reduced.

In one study, vitamin E succinate, a derivative of fat-soluble vitamin E, inhibited growth and induced apoptic cell death in estrogen receptor-negative human breast cancer cell lines. The study concluded that vitamin E succinate may be of clinical use in the treatment of aggressive human breast cancers, particularly those that are resistant to anti-estrogen therapy.

Estrogen receptor-negative breast cancer patients should consider taking 1,200 IU of vitamin E succinate a day.

Soy extracts have become very popular in the last few years as an adjuvant (assisting) cancer therapy. However, there are some cancer patients who should not use soy, or who are less likely to benefit from soy.

Cancer patients undergoing radiation therapy should not take soy supplements one week before, during, and one week after being treated. Soy inhibits protein kinase C activity in cancer cells. Since cancer cells use protein kinase C for energy production, inhibiting this enzyme is usually desirable. Radiation therapy, on the other hand, depends on protein kinase C to help generate free radicals that kill cancer cells. It's possible, therefore, that large amounts of genistein in cancer cells could protect them against radiation-induced free-radical-mediated destruction.

In studies, genistein has shown anti-angiogenesis effects. Angiogenesis (new blood vessel growth) is a key step in tumor growth, invasion and metastasis. To date, a number of anti-angiogenic agents have been identified. In animal models, treatment with angiogenesis inhibitors has proven anti-tumor effects. Early clinical experience with angiogenic inhibitors indicates that optimal anti-angiogenic therapy will likely be based on the long-term administration of genistein to cancer patients as an adjunct to surgery and conventional chemotherapy. Genistein is one of the more potent nutritional anti-angiogenesis agents.

Genistein also has been shown to have cancer cell adhesion inhibition properties, and apoptosis-inducing (programmed cancer cell death) effects.

An investigation into the effects of soy genistein on the growth and differentiation of human melanoma cells showed that genistein significantly inhibited cell growth. Some studies suggest that genistein may enhance the benefits of certain chemotherapy regimens.

One study showed that genistein inhibited the proliferation and expression of the invasive capacity of prostate cancer cells in vitro. Genistein proved to be cytotoxic to a line of prostate cancer cells. The more aggressively the prostate cancer cells grew, the more effective genistein was in inhibiting both growth factors and the rate of cellular proliferation. Prostate cancers often have similarities to breast cancers.

Curcumin and genistein both have been shown to inhibit the growth of estrogen-positive human breast cancer cells induced by pesticides. When curcumin and genistein were added to breast cancer cells, a synergistic effect resulted in a total inhibition of cancer cell growth caused by pesticide-induced estrogenic activity. This study suggested that the combination of curcumin and genistein in the diet has the potential to reduce the proliferation of estrogen-positive cells induced by mixtures of pesticides or estrogen. Since it is difficult to remove pesticides completely from the diet and since both curcumin and soy genistein is not toxic to humans, their inclusion in the diet in order to prevent hormone-related cancers deserves consideration.

A study was conducted to determine if genistein can induce human breast adenocarcinoma cell maturation and differentiation. Treating these cells with genistein resulted in growth inhibition accompanied by increased cell maturation. These maturation markers were optimally expressed after nine days of treatment with genistein. Both estrogen receptor-positive and estrogen receptor-negative cells became differentiated in response to genistein, which is a crucial step in inducing cancer cell apoptosis.

Naturally occurring flavonoids, like genistein, were tested for their effects on the proliferation of an estrogen receptor-positive human breast cancer cell line. Genistein inhibited cell proliferation, but was reversed with the addition of excess competing estrogen. The flavonoids hesperidin, naringenin and quercetin inhibited breast cancer cell proliferation, even in the presence of high levels of estrogen. These flavonoids apparently exert their anti-proliferative activity via a mechanism different from that of genistein.

A study was conducted to determine if genistein can induce human breast adenocarcinoma cell maturation and differentiation. Treating these cells with genistein resulted in growth inhibition accompanied by increased cell maturation. Optimal maturation was achieved after nine days of treatment with genistein. Both cancer cells with positive estrogen-receptors and negative estrogen-receptor cells differentiated in response to genistein, a crucial step in the induction of cancer cell apoptosis.

Despite these studies, the Life Extension Foundation does not recommend that women with estrogen receptor-positive breast cancer use soy genistein. The Foundation has made a preliminary determination that women with estrogen receptor-positive breast cancer should not take soy supplements based on evidence that an estrogenic growth effect could occur in some forms of estrogen receptor-positive breast cancer. Until more is known about the effects of soy phytoestrogens in this type of cancer, compounds such as genistein should be avoided in those with estrogen receptor-positive breast cancer.

There are, however, even newer studies that indicate that genistein may benefit those with estrogen receptor-positive breast cancer cells. The Foundation is evaluating studies and expects to make new recommendations soon.

The most potent soy extract on the market is called Mega Soy Extract. It contains almost 40% pure soy isoflavones...much higher than previous soy products. The suggested dose for non-estrogen receptor-positive breast cancer patients is five 700-mg capsules of Mega Soy Extract four times a day. This provides the optimal daily dose of approximately 2,800 mg of standardized genistein.

Genistein is rapidly metabolized within the body, which makes it necessary for cancer patients to take Mega Soy Extract in four divided doses spaced evenly throughout the day.

Women with any type of breast cancer should test their serum estrogen levels to make sure that too much estrogen is not present if they are taking high doses of soy. Estrogen can combine with the genistein to cause some breast cancer cells to grow faster. Other studies show that genistein blocks certain types of estrogen-receptor sites, thus inhibiting the proliferation of these types of breast cancer cells.

Breast cancer patients whose tumor cells have a mutant p53 oncogene are far more likely to benefit from soy extract supplementation. Only a pathology examination of the actual cancer cells can determine p53 status. An immuno-histochemistry test can help to determine the p53 status of tumor cells. The following laboratory can perform this test:

IMPATH Laboratories
1010 Third Avenue, Suite 203
New York, N.Y. 10021
Phone: 1-800-447-5816

IMPATH Laboratories measures mutant p53. If the test is positive, you have mutant p53 and are more likely to benefit from soy extracts. If the test is negative, this indicates that you have functional p53 and are less likely to benefit from soy extracts. The Foundation realizes that many cancer patients seeking to use soy supplements may find it difficult to have an immuno-histochemistry test performed to ascertain p53 status.

Monthly blood testing for breast cancer patients is mandatory. Every patient responds differently to both conventional and alternative cancer therapies. The results of blood tests provide critically important data to evaluate the effectiveness of both conventional and alternative therapies. The blood tests commonly used by doctors to evaluate progression or regression of breast cancer are CA 27.29, CA15-3, CEA, prolactin, GGTP and alkaline phosphatase. If, for instance, the CA 27.29 tumor marker were to continue to elevate 30 to 60 days after initiating soy extract supplementation, discontinue its use and seek another therapy immediately.

Breast cancer patients often have elevated levels of the pituitary hormone prolactin. Abnormally high levels of prolactin can interfere with successful breast cancer therapy. If a blood test reveals elevated prolactin levels, the oncologist should be encouraged to prescribe 1.25 to 2.5 mg of the drug Parlodel, also known as bromocriptine. Parlodel must be taken after meals because severe nausea can occur when it is taken on an empty stomach. A better way to suppress prolactin is with Dostinex. Just twice-a-week dosing of 0.25 mg to 0.50 mg is needed, and side effects are rare. The objective is to suppress serum prolactin levels to under 3 nanograms per milliliter (3 ng/mL) of blood. Any blood-testing laboratory can arrange to do a prolactin serum level test.

There are phytochemicals in cabbage and broccoli that interfere with breast cancer cell growth. Studies show that the phytochemical 3-indole carbinol can inhibit activation of the estrogen receptor, thus lowering estrogenic stimulation in estrogen-dependent breast cancer cells.

The daily juicing of fresh organic cabbage and/or broccoli is suggested for breast cancer patients. For those who find it too inconvenient to juice cabbage and broccoli every day, a product called Phyto-Food powder, composed of potent concentrations of broccoli, cabbage and other cruciferous vegetables, contains phytochemicals that help fight cancer. Breast cancer patients should take two heaping tablespoons of Phyto-Food powder every day.

Preliminary research from Europe indicates encouraging results when breast cancer patients take 300 to 400 mg a day of coenzyme Q10. Breast cancer patients should thus consider taking 300 to 400 mg a day of coenzyme Q10 in oil-filled capsules for maximum absorption.

The most current research shows that some of the ingredients in green tea may have a beneficial effect in treating cancer. While drinking green tea is a well-documented method of preventing cancer, it is difficult for the cancer patient to obtain a sufficient quantity of anti-cancer components in that form. We suggest that a person with breast cancer take four to 10 decaffeinated green tea extract capsules every day. These capsules contain a standardized extract of epigallocatechin gallate, which is the component of green tea that makes it an effective adjunct therapy in the treatment of breast cancer.

Radiation exposure as a result of the Chernobyl nuclear power plant accident in the Soviet Union in April 1986 increased the cancer risk of the nearby population and emergency workers. A long-term experiment in 400 rats exposed to radiation following the Chernobyl pattern showed that a selenium-enriched diet started after exposure caused a longer average life span and a 1.5- to 3.5-fold decrease of leukemias and other malignancies, including breast cancer. Selenium has been shown to directly induce growth arrest and death of mammary cancer cells in mice, although it cannot be inferred that selenium by itself can result in breast cancer remission in humans. Breast cancer patients should consider 200 micrograms of organic selenium (selenomethionine), two to

three times a day.

One of the most exciting new therapies in the prevention and treatment of breast cancer is conjugated linoleic acid (CLA). CLA is the component of beef that has direct breast cancer cell inhibitory effects. CLA has been shown both in vitro and in animal models to have strong anti-tumor activity. Particular effects were observed on the growth and metastatic spread of transplantable mammary tumors. One study examined the effect of dietary CLA on the growth of human breast adenocarcinoma cells in mice. Dietary CLA inhibited local tumor growth by 73% and 30% at nine and 14 weeks post-inoculation, respectively. Moreover, CLA completely abrogated the spread of breast cancer cells to lungs, peripheral blood, and bone marrow. This indicates the ability of dietary CLA to block the local growth and systemic spread of human breast cancer. For breast cancer prevention and treatment, it is suggested that six to 10 500-mg capsules of CLA a day be taken. Estrogen receptor negative breast cancer patients should take at least 800 mg of soy genistein when taking CLA.

Lignans are an important class of phytochemicals found in flax seed. When rats are fed a diet containing ground flax seed, it becomes very difficult to develop a breast tumor, even when breast cancer cells have been injected directly into the animal. Rats not given flax seed readily develop breast cancers in response to injections with live cancer cells.

When rats with large breast tumors were fed flax seed, the breast tumors shrunk. In laboratory monkeys who eat lignans in their lab chow, it is very difficult to induce breast tumors. Ground flax seed (but not flax oil) provides a healthy dose of lignans. The most efficient way of consuming fresh flax seed with other cancer-fighting phytochemicals is to consume two to five tablespoons a day of The Missing Link for Humans, a specially designed flax seed-based meal replacement food.

Garlic is a well-established cancer-preventing nutrient. A study investigated aged garlic extract in an effort to determine whether it could inhibit proliferation of cancer cells. The proliferation and viability of erythroleukemia, hormone-responsive breast and prostate cancer cell lines were evaluated. The erythroleukemia cells were not significantly affected by the garlic extract, but the breast and prostate cancer cell lines clearly were susceptible to the growth-inhibitory influence of aged garlic extract. The anti-proliferative effect of aged garlic extract was limited to actively growing cells. This study provided evidence that garlic can exert a direct effect on established cancer cells.

Aberrant hyper proliferation is a late-occurring event that precedes mammary tumorigenesis in vivo. A study conducted on pre-cancer cells showed that eicosapentaenoic acid (EPA), indole-3-carbinol (broccoli-cabbage extract), and green tea extract resulted in a 70%-to-99% inhibition of aberrant hyperproliferation.

Whey appears to inhibit the growth of breast cancer cells at low concentrations. One clinical study with cancer patients showed a regression in some patient's tumors when fed whey protein concentrate at 30 grams per day.

Research using whey protein concentrate has led researchers to a discovery regarding the relationship between cancerous cells, whey protein concentrate and glutathione, an antioxidant that protects the body against harmful compounds. It was found that whey protein concentrate selectively depletes cancer cells of their glutathione, thus making them more susceptible to cancer treatments such as radiation and chemotherapy.

It has been found that cancer cells and normal cells will respond differently to nutrients and drugs that affect glutathione status. What is most interesting to note is the fact that the concentration of glutathione in tumor cells is higher than that of the normal cells that surround them. This difference in glutathione status between normal cells and cancer cells is believed to be an important factor in cancer cells' resistance to chemotherapy.

As the researchers put it, "Tumor cell glutathione concentration may be among the determinants of the cytotoxicity of many chemotherapeutic agents and of radiation, and an increase in glutathione concentration in cancer cells appears to be at least one of the mechanisms of acquired drug resistance to chemotherapy." They further state, "It is well-known that rapid glutathione synthesis in tumor cells is associated with high rates of cellular proliferation. Depletion of cancer cell glutathione in vivo decreases the rate of cellular proliferation and inhibits cancer growth."

The problem is, it's difficult to reduce glutathione sufficiently in tumor cells without placing healthy tissue at risk and putting the cancer patient in a worse condition. What is needed is a compound that can selectively deplete the cancer cells of their glutathione while increasing, or at least maintaining, the levels of glutathione in healthy cells. This is exactly what whey protein appears to do.

In this research, it was found that cancer cells subjected to whey proteins were depleted of their glutathione and their growth was inhibited, while normal cells had an increase in glutathione and increased cellular growth. These effects were not seen with other proteins. Not surprisingly, the researchers concluded, "Selective depletion of tumor cell glutathione may in fact render cancer cells more vulnerable to the action of chemotherapy and eventually protect normal tissue against the deleterious effects of chemotherapy." The exact mechanism by which whey protein achieves this is not fully understood, but it appears that it interferes with the normal feedback mechanism and regulation of glutathione in cancer cells. It is known that glutathione production is

negatively inhibited by its own synthesis. Since baseline glutathione levels in cancer cells are higher than that of normal cells, it is probably easier to reach the level of negative-feedback inhibition in the cancer cells' glutathione levels than in the normal cells' glutathione levels.

Monthly blood tests should include a complete blood chemistry with tests for liver function and serum calcium levels, prolactin levels, parathyroid hormone levels and the tumor marker CA 27.29, and Cancer Profile tests (CA Profile) that includes the CEA and GGTP tests. These tests monitor the progress or failure of whatever therapies are being used, and also are able to detect toxicity from high doses of vitamin A and vitamin D3. Patients should insist on obtaining a copy of their blood workups every month.

Further Reading

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