Integrating Nutrition and Selected Controversial Nutritional Supplements into a Cancer Treatment Program

Michael Schachter, MD

Dietary issues for cancer patients and selected controversial supplements for cancer patients are discussed. Specific topics covered include studies suggesting benefits of a nutrition program and benefits of a broad range supplement program for cancer patients, vitamin C, iodine, supplements developed by the late Mirko Beljanski PhD, CYP1B1 and Salvestrols.

Although many physicians would acknowledge that nutritional factors are important in preventing cancer, the vast majority of oncologists fail to discuss nutritional and lifestyle factors to help their patients already diagnosed with cancer. Oncologists often avoid the body of cancer cells with surgery, radiation, chemotherapy and most recently targeted medications, like Herceptin and Avastin. Little attention is paid to lifestyle factors, nutritional recommendations or nutritional supplements. Oncologists often give patients dietary advice that is exactly opposite to the advice contained in cancer-preventive diets. Patients are often told to eat high calorie, high fat, high protein, high refined carbohydrate diets with lots of sugar and other refined processed foods. They are sometimes told that it doesn’t matter what you eat as long as you eat enough calories to sustain your weight during conventional treatment.

There is considerable direct and indirect evidence that some of the same recommendations designed to prevent cancer should also be applied to treating cancer. A study should improve both cancer patient survival rates and quality of life issues including reducing side effects of conventional treatments. Dr. Charles Simone and Patrick Quillin in their books on nutrition and cancer show the benefits of excellent nutrition for patients undergoing conventional cancer treatment, indicating references to support their recommendations.

Common sense tells us that a patient’s clinical outcome will be related to his nutritional intake. Food supplies the building blocks for all cellular structures in the body (cell membranes, DNA, proteins, etc...) It supplies substances that, when combined with oxygen in the body yields energy for all biochemical reactions. Finally, food supplies information to the genes of the body to help regulate all biological processes. This epigenetic information can help the genes to repair and heal the body or cause a deterioration of the healing process, depending upon what information from food is supplied.

One important area of concern for cancer patients and people in general has to do with exposure to toxins and how well the body is able to rid itself of these toxins. Toxins may be carcinogenic or toxic in other ways. We are what we eat, drink, breathe, touch, absorb and cannot eliminate. We have many systems in our body to help protect us from toxins and to eliminate them. We have the barrier function of our skin and our mucus membranes. We eliminate many toxins through bowel movements and it is therefore important for all us to move our bowels at least once daily. One of the main functions of the liver is to eliminate toxins. This is generally done in two steps. In the first step, known as phase 1, toxic organic molecules are oxidized to a more water-soluble form. During the second step or phase 2, this oxidized molecule is conjugated to another organic molecule for easier elimination either through urine or feces via the bile. Some examples of these molecules that conjugate are: sulfates, glucuronic acid, glutathione and glycos. Many phytonutrients in fruits, vegetables and herbs are capable of influencing the detoxification pathways to help the body eliminate toxins. For example, sulforaphane derived from broccoli sprouts, up-regulates phase 2 of liver detoxification and has many anti-cancer properties.

The Macrobiotic Diet and Cancer

It is difficult to find controlled studies comparing a group of cancer patients receiving only conventional treatment with another group that receives conventional treatment along with a dietary program that includes many of the principles of nutrition that I discuss in this article. One such study recorded the survival time from diagnosis of pancreatic cancer patients who ingested a macrobiotic diet, which consists primarily of whole, plant based foods. In this first major scientific study of the macrobiotic approach to cancer, researchers at Tulane University reported that the median survival among patients with pancreatic cancer was significantly higher among those who modified their diet than among those who did not (17 months versus 6 months). The one-year survival rate was 54.2 percent in the macrobiotic patients versus 10.0 percent in the controls. All comparisons were statistically significant.

Also reported by the same authors was a study in which prostate cancer patients with metastatic disease were prescribed a macrobiotic diet. This case control study demonstrated that those who ate macrobiotically lived longer (177 months compared to 91 months) and enjoyed an improved quality of life. The researchers concluded that the macrobiotic approach may be an effective adjunctive treatment to conventional treatment or in primary management of cancers with a nutritional association. “This exploratory analysis suggests that a strict macrobiotic diet is more likely to be effective in the long-term management of cancer than are diets that provide a variety of other foods.”

General Recommendations

In spite of the limited number of published studies on this subject, many nutritionally oriented clinicians are convinced that an optimal nutritional program is essential for improving the results of cancer treatment. Such a program should be recommended for cancer patients and not reserved only for those trying to prevent it. Furthermore, a nutritional program should be used by patients who have undergone successful conventional treatment and who are searching for ways to help prevent a recurrence.

Here is a list of dietary recommendations that I give to my cancer patients. I suggest...
they avoid: sugar and white flour products; alcohol, caffeine, fluoridated and chlorinated water, foods containing bromine, hydrogenated fats and all trans fatty acids, artificial chemicals added to foods [such as artificial sweeteners like aspartame and sucralose (Splenda), artificial colors and flavors, preservatives]; fish contaminated with mercury; and genetically modified food. Many people are sensitive to gluten (protein found in wheat, rye and barley) and those people should avoid these foods. Thomas Seyfried PhD, in his book Cancer as a Metabolic Disease emphasizes that cancer patients (especially brain cancer patients) should be on a relatively low carbohydrate diet and that good fats should be emphasized. In his studies with mice, he has found that a calorie restricted ketogenic diet increases the survival time of his mice with brain cancer. Food allergens should also be avoided.

Non-dietary items to be avoided include: tobacco, recreational drugs like opiates and cocaine, mercury amalgam dental fillings; exposure to toxic chemicals; synthetic hair dyes; aluminum containing antiperspirants; harmful electromagnetic frequencies (such as cell phones as much as possible, microwave ovens); exposure to nuclear plants; and tight fitting clothing such as wired bras, which cut off lymphatic circulation within the breasts. A more complete list of items to avoid can be found at my website: www.schachtercenter.com (click on literature and articles and look for Avoid list).

I suggest that my patients eat primarily whole foods, mostly plant-based, largely raw and preferably organic. However, for some patients, a diet that emphasizes high quality grass-fed animal products, preferably organic, along with high quality plant-based foods may be fine or even preferable to a diet restricted to only plant-based foods, especially if the patient is undergoing conventional treatment. I recommend that my patients shop in the outer isles of the supermarket where most whole foods are kept and that they avoid the inner isles, which largely have packaged processed foods. A wide variety of vegetables, fruits, nuts and seeds and legumes should be eaten and attempts should be made for the foods in the diet to be of many colors (a rainbow array), as this helps to ensure that a wide variety of phytonutrients are obtained in the diet. Fresh, raw, vegetable juices with a smaller amount of fruit are excellent. Animal foods should generally be unprocessed, without chemical additives. Meat should be from grass fed animals and organic when possible. Dairy should be certified raw if it is available. Eggs should be from free-range chickens and organic when possible. For most people, I do not recommend total elimination of animal products. Food should not be overcooked or burned. Low glycemic index foods should be eaten, as it is clear that higher levels of blood sugar drive cancer cell growth.

Additional suggestions I give to my patients include: (1) Eat slowly and chew your food well to improve digestion and prevent gastric upset; (2) Don’t skip breakfast because studies have shown that people who eat breakfast generally have a lower intake of total calories for the day and have a better insulin sensitivity; (3) Meals should not be skipped as doing so causes an increase in insulin resistance; (4) Cooking methods matter, as harsh cooking methods produces carcinogenic heterocyclic amines, oxidized cholesterol, lipid peroxides and advanced glycation end products (AGEs), all of which are carcinogenic; (5) It is best to boil, poach or stew foods and avoid frying, broiling and roasting; and (6) Avoid the microwave, which tends to destroy nutrients and change blood chemistry.

If physicians caring for cancer patients helped them to improve their diets, several positive effects could be expected. These include: (1) Avoidance of malnutrition (many patients die from malnutrition, rather than the cancer process itself); (2) Minimization of adverse effects from conventional treatment; (3) Optimization of cytotoxic effects on cancer cells; (4) Protection of healthy tissue; (5) Healthy cell proliferation; (6) Immune enhancement, helping to protect the patient against infections; (6) Beneficial hormone changes.

Use of Nutritional Supplements

One of the most controversial areas surrounding the care of cancer patient relates to whether or not they should receive nutritional supplements while undergoing radiation and/or chemotherapy. Many oncologists advise cancer patients not to take any nutritional supplements because they contain anti-oxidants and since radiation and chemotherapy are pro-oxidant, the nutritional supplements theoretically will interfere with the activity of these pro-oxidant treatments. So, the important question is: will nutritional supplements improve or interfere with conventional treatment? Clearly, the answer to this question will depend upon the conventional treatment being used, what supplements and what dosage are being considered, the genetics of the patient and other factors within the patient. Also, environmental factors, such as the patient’s diet will also be important.

Before trying to answer the question as to the value of nutritional supplements while undergoing conventional cancer treatment, it might be helpful to discuss the similarities and differences between conventional treatment and nutritional supplements. An ideal chemotherapeutic agent would be one that is highly selective in its action by promoting the destruction of cancer cells while not harming or even nurturing normal cells. Unfortunately, conventional therapy does not do this. Surgery, radiation, chemotherapy, and the newer targeted treatments generally are harmful to normal cells as well as cancer cells; hence the adverse side effects observed during their administration. Some nutritional supplements, on the other hand, may be harmful overall to cancer cells while nurturing normal cells. In other words, nutritional supplements generally have different effects on cancer cells than they have on normal cells. In his excellent, extremely well documented book, Natural Compounds in Cancer Therapy: Promoting Nontoxic Anti-tumor Agents from Plants & Other Natural Sources, John Boik, PhD outlines a series of pro-cancer events that occur during the development of cancer and shows how natural substances can interfere with these processes without harming normal cells. These events are:

(1) Gene mutations and genetic instability; (2) Gene expression (Switching oncogenes and/or tumor suppressor genes on and off); (3) Abnormal signal transduction; (4) Abnormal cell to cell communication; (5) New blood vessel formation angiogenesis; (6) Invasion into tissues; (7) Metastasis to other organs; and (8) Immune suppression and other forms of immune evasion.

With multiple references, Boik explains how various natural substances that can be found in nutritional supplements can affect these processes. Many of the substances can affect several steps of the process. For example, Curcumin (derived from turmeric) inhibits PTK, PKC, NFKB and PGE2 synthesis (all of which play a role in inflammation and cancer); inhibits invasive enzymes and stimulates or supports the immune system. EPI (from fish oil) inhibits PKC and PGE2 synthesis (both of which contribute to cancer growth), stimulates or supports the immune system and inhibits invasive enzymes. Vitamin D3 (1,25 Dihydroxy D) is involved with 9 possible anti-cancer effects, melatonin with 13, vitamin A with 13 and Boswellic acid with 15. Many other natural substances have significant anti-cancer effects without harming normal cells.

Boik suggests that many natural comb
of these studies were human clinical trials involving 8,521 patients, 5,081 of whom were given nutrients. These studies consistently showed that nonprescription anti-oxidants and other nutrients do not interfere with therapeutic modalities for cancer and actually enhance the efficacy of conventional cancer therapies and decreased their side effects, protecting normal tissue. In 15 human studies, 3,738 patients who took non-prescription antioxidants and other nutrients had increased survival.2

Effects on Survival of a Combination of Nutritional Supplements

There are not many studies evaluating the efficacy of nutritional supplements in part because there just isn’t the economic motivation to do these studies since supplements are not patentable. Pharmaceutical companies carry out the vast majority of clinical research with clinical trials for patentable drugs. Nevertheless, there are a few suggestive studies involving a single nutrient, but most physicians are not aware of them. Fewer studies have been done on a combination of a variety of supplements.

One such non-randomized study involving a combination of nutrients was carried out in Finland by Jaakola et al. It involved patients with small cell lung cancer and was published in 1992. It involved 18 patients who received a number of vitamins and minerals (several in relatively high doses), along with conventional treatments.6 The vitamin supplements with dosages used in the study are found in Table 1 and a list of minerals used is found in Table 2.

The endpoint for the study was a simple one, namely the survival time of the patients from the time of diagnosis compared to the survival statistics of The United States National Cancer Institute’s Surveillance, Epidemiology, and End Results (SEER) Program for a similar group of patients. Figure 2 contains survival statistics.

This graph clearly shows that patients receiving nutritional supplements along with conventional treatments lived significantly longer than those just receiving conventional treatment. The conclusions of the study were: (1) Antioxidants (AOX) and other nutrients given to small-cell lung cancer patients along with conventional treatment drastically improved long-term survival; (2) “(There) were no side effects observed (from nutrients);” (3) “Surviving patients started AOX treatment earlier than those who succumbed;” (4) “AOX treatment should start as early as possible in combination with chemo and/or radiation.” Granted this was a very small study, but the statistics are truly amazing. An unbiased observer would expect that this study would have at least provoked some interest and an attempt would have been made to replicate it, but I could find no evidence of this in the medical literature.

Vitamin C - Conflicting Studies

Linus Pauling, two-time Nobel Prize winner was first introduced to the concept of high-dose vitamin C by biochemist Irwin Stone in 1966. Being convinced of its worth and championing its use for the common cold, Pauling began to collaborate with Scottish cancer surgeon Ewan Cameron in 1971 on the use of intravenous and oral vitamin C as cancer therapy for terminal cancer patients. The reasoning was that cancer patients were generally depleted of ascorbate and ascorbate had numerous anticancer activities.

They conducted a study involving 100 terminal cancer patients in a Scottish Hospital. This group of patients was matched with a comparable group of patients of similar age and diagnosis who were not given any vitamin C. The endpoint of the study was the time to death for patients receiving the C as compared to patients not receiving any vitamin C. No significant adverse effects were noted in the patients receiving vitamin C. The oral dosage of vitamin C that was given was 10 grams daily in divided dosages. Additionally, many of the patient received 10 grams of vitamin C intravenously for 10 days prior to starting the oral vitamin C. An analysis of the survival-time curves indicated that deaths occurred for about 90% of the ascorbate-treated patients at one-third the rate for the controls and that the other 10% had a much greater survival time, averaging more than 20 times the controls.11, 12 Cameron and Pauling concluded that high doses of vitamin C should be given to all patients.
cancer patients.

The medical establishment rejected the conclusions of Cameron and Pauling after a series of papers by Dr. Charles Moertel and his group from the Mayo Clinic failed to confirm their findings.13, 14 Pauling bitterly criticized these studies and claimed that they did not replicate his studies, as the experimental designs for the Moertel studies were completely different from those used by Cameron and Pauling.15 For example, the Cameron and Pauling studies gave patients vitamin C until they died whereas the Moertel studies gave patients vitamin C until they showed evidence of cancer progression; then they were given chemotherapy and monitored until they died. The latter study showed no increase in survival time in cancer patients receiving vitamin C; but clearly the experimental designs were quite different.

Studies from the National Institute of Health suggest high doses of vitamin C (achieved with intravenous but not oral doses of ascorbate) induce cancer cell death without harming normal cells.21 Although these studies have awakened some interest in vitamin C for cancer patients, most cancer specialists today still regard vitamin C as either having no effect or being harmful to cancer patients. Furthermore, although these studies were done at the National Institutes of Health (NIH), the National Cancer Institute (NCI) initially showed little interest in pursuing this line of research. However, Jeanne Drisko MD, a professor at the University of Kansas Medical School, has recently been involved with conducting clinical research on ovarian and pancreatic cancers using intravenous vitamin C along with conventional treatments. These studies were partially supported by the NCI.

Orthomolecular Treatment

In the early 1980’s, Abram Hoffer MD, who did the first randomized, double-blind studies in psychiatry, using high doses of niacin for schizophrenia in the mid-1950’s, evaluated a schizophrenic patient for treatment with high doses of niacin and vitamin C. This woman also had a lymphoma. Not only did the patient recover from schizophrenia, but much to the surprise of Dr. Hoffer, her lymphoma also went into remission. The word got out and soon Dr. Hoffer was bombarded with requests from cancer patients to be put on a nutritional regiment. At the urging of Dr. Pauling, Dr. Hoffer began to keep track of all of the cancer patients that he put on this nutritional program and reported on the survival time of these patients in a series of articles. This study and related studies are available online at: http://orthomolecular.org/library/ from Click on search after inserting the search words “cancer,” “Hoffer.”

The Hoffer protocol given to the treated patients included: (1) Improved diet with the elimination of so called junk foods (refined, processed foods containing sugar, white flour and additives; low fat and elimination of allergic foods; (2) Vitamin C 10 to 40 grams a day by mouth; (3) Vitamin B3 (Niacin or Nicotinamide) 300 mg to 3,000 mg daily; (4) Vitamin B6 200 to 300 mg daily; (5) Folic Acid 1 to 30 mg daily; (6) Vitamin E Succinate 400 to 1,200 IU daily; (7) Mixed carotenoids, as carrot juice; (8) Multivitamin and mineral; (9) Coenzyme Q10 300 mg to 600 mg daily, Selenium 200 to 1,000 mcg daily, (10) Zinc 25 to 100 mg (with some copper); (11) Calcium and magnesium in a 2:1 ratio. Most nutrients were given in divided dosages two to three times daily.

The survival statistics for Dr. Hoffer’s first 131 patients treated between 1976 and 1988 are shown in Table 3. At the end of one year, 28% of the controls were alive compared to 77% of the treated group. At 3 years, 16% of the control group was alive compared to 56% of the treated group. By 5 years, 5% of the control group and 46% of the treated group were alive, while at 7 and 9 years, there were no survivors in the control group, but 39% and 34% respectively in the treated groups. The survival statistics for 769 patients through 1997 are shown in Table 4. Again, we see a marked difference in survival each year up to 5 years. The conclusions from the Hoffer studies were: (1) Patients with a wide variety of advanced cancers have significantly improved survival when a nutritional program is added to their conventional treatment; (2) The nutritional program consisted of dietary suggestions and relatively high doses of vitamins, minerals and other nutritional supplements.16

**Intravenous Vitamin C for Cancer**

The first recommendation for IV Vitamin C for cancer patients appeared in 1971. In their book on cancer and vitamin C, Cameron and Pauling summarized their work with vitamin C for cancer patients both orally and by intravenous use.17 As mentioned previously, in their study, IV Vitamin C at 10 grams was administered daily for 10 days prior to starting the oral vitamin C. In 1990, the late Hugh Riordan MD and his group in Wichita Kansas reported a rather amazing case study of a patient with kidney cancer who had a long-term remission with IV treatments of Vitamin C in the range of about 15 to 30 grams, a few times a week.18 A paper in Medical Hypothesis in 1995 by Riordan’s group described IV ascorbate as a tumor cytolytic chemotherapeutic agent.19 They reported that ascorbic acid and its salts are preferentially toxic to tumor cells in vitro and in vivo and that “given in high enough doses to maintain plasma concentrations above levels that have been shown to be toxic to tumor cells in vitro, ascorbic acid has the potential to selectively kill cancer cells in a manner similar to other tumor cytolytic agents.” A major point here is that at these concentrations, ascorbic acid is NOT toxic to normal cells.

Mark Levine MD at the NIH wrote a commentary in the Journal of the American College of Nutrition in 2000 pointing out that concentrations in the bloodstream of IV vitamin C were capable of killing cancer cells and not normal cells and that “ascorbate treatment of cancer should be reexamined by rigorous scientific scrutiny in the light of new evidence.” Dr. Levine has recently teamed up with my friend and colleague Jeanne Drisko MD, professor at the University of Kansas Medical School and one or the other or both have been involved in recent research on the effects of high concentrations of ascorbate for cancer. Some nutritionally oriented practitioners are under the impression that ascorbate at these high levels functions as an antioxidant, but Mark Levine has clearly shown that at these levels, ascorbate is a pre-oxidant. His group even worked out the mechanism for this with in vitro and animal studies. At high ascorbate concentrations, ascorbate forms hydrogen...
peroxide in the extracellular spaces. This hydrogen peroxide easily permeates both normal and cancer cells. It generally has no effect on normal cells at these concentrations as the catalase enzyme in normal cells converts the hydrogen peroxide to water and oxygen. But, in many cancer cells, the concentration of catalase is greatly reduced and the hydrogen peroxide forms free radicals in cancer cells leading to cancer cell death in many of them.  

The notion that high levels of ascorbate functions as a pro-oxidant rather than an anti-oxidant was supported by a recent study in which it was shown that when glutathione was administered along with ascorbate, the cancer killing effects of ascorbate were reduced in vitro. Furthermore, using a pancreatic cancer model in mice, the combination of IV ascorbate and IV glutathione resulted in no more additional survival value than the ascorbate alone. This led Jeanne Drisko MD to recommend not giving IV glutathione on the same day as high dose ascorbate.  

Mark Levine, who conducted a study done at a meeting of the American College for Advancement in Medicine (ACAM), asked participants at the conference to fill out questionnaires about their use of intravenous ascorbate. He determined that the practice was quite common and to his surprise, extremely safe.  

In my clinical experience, patients undergoing chemotherapy with other physicians, but receiving high dose intravenous ascorbate at our office in between their chemotherapy treatments, invariably report that they appear to be doing better than other patients at the oncologist’s office who are not receiving high dose vitamin C. Furthermore, in our practice at the Schachter Center for Complementary Medicine in Suffern, NY (www.schachtercenter.com), we have been using high dose IV ascorbate (10 to 120 gram infusions) in cancer patients for more than 30 years. Each patient receives a comprehensive program involving dietary suggestions, a variety of nutritional supplements, an exercise program, stress management program and other life style enhancing suggestions. Our patients appear to do very well and we believe that the IV infusions play an important role in their treatment. We usually give about 60 grams of vitamin C, 10 cc of Calcium Gluconate and 4 cc of Magnesium Chloride in 500 cc of sterile water and administer this over about 2 hours. Some of our patients are concurrently undergoing conventional treatment while others have finished conventional treatment and have decided to use our program to better control the disease or prevent recurrence. Still others have chosen to do this program instead of conventional recommendations for radiation therapy and/or chemotherapy and/or targeted therapy. Our clinical impression is that the high dose ascorbate infusions improve clinically relevant subjective and objective results, though we have not done any formal studies to prove this.  

Iodine: A Misunderstood Nutrient  
Iodine supplementation should be considered in all cancer patients. Dr. Max Gerson successfully treated many cancer patients with a variety of unconventional techniques including more than 10 glasses a day of raw vegetable juice daily, coffee enemas, a vegan diet, flaxseed oil, cod liver oil, thyroid hormone and Lugol’s solution which contains a relatively high concentration of iodine. Harry Hoxsey, another controversial alternative cancer practitioner, used potassium iodide in his Hoxsey formula. Prior to World War II, Lugol’s solution was used by numerous physicians worldwide to treat many different conditions. Since then, with the growth of pharmaceutical companies and the widespread use of patentable drugs, inorganic, non-radioactive iodine has not been used for cancer patients or for patients with other disorders who would have previously been treated with iodine.  

Guy Abraham MD, former professor of obstetrics, gynecology and endocrinology at UCLA School of Medicine, has written a series of papers about iodine that has changed my thinking about its role in health and the prevention and treatment of disease. He terms this series of papers “The Iodine Project.” These articles are available for free download at: http://www.optimox.com/pics/iodine/opt.Research.1.shtml. Dr. Abraham has proposed that the optimal daily dose of iodine for an adult is approximately 12.5 mg to 50 mg daily, which is close to 100 to 400 times the RDA of 150 micrograms (mcg) daily. He believes that the current prevailing medical opinion, that more than 2 mg a day of iodine is toxic, is wrong. He terms the medical profession’s irrational fear of iodine as “iodophobia” and explains in some of his papers how this fear developed.  

In addition to the aforementioned website, considerably more information is available about this controversial view of iodine in David Brownstein’s book Iodine: Why You Need It and Why You Can’t Live Without It and Lynne Farrow’s recently published book, The Iodine Crisis. Also, available from www.schachtercenter.com is a DVD of a lecture on the history of iodine’s use in medicine and its various applications that I gave in 2010. The title of the lecture is “Unrefined Salt and Iodine: Misunderstood Nutrients.” Patient iodine support groups can be found at: http://curezone.org/forums/index.asp?f=815 and www.HealthGroups.yahoo.com/group/iodine.  

The commonly accepted medical opinion is that iodine’s only role in the body is to help make thyroid hormones. Although this is an extremely important function, Abraham and others have demonstrated that the role of iodine in the body goes far beyond this function. Every cell of the body uses iodine. The RDA for iodine of 150 micrograms daily (0.15 mg) is generally sufficient to prevent goiter and to preventcretinism in infants when the pregnant mother ingests this dosage. However, this dosage is totally insufficient to supply the needs of all cells in the body. For example, Finley reported that fibrocystic breast disease could be reversed with 5 mg or more  

Table 3: Dr. Hoffer’s First 131 Cancer Patients Treated from 1976 to 88

<table>
<thead>
<tr>
<th>Group</th>
<th>Treated</th>
<th>Untreated</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Number</td>
<td>97</td>
<td>18</td>
</tr>
<tr>
<td>Alive at 1 year</td>
<td>77%</td>
<td>28%</td>
</tr>
<tr>
<td>Alive at 3 years</td>
<td>56%</td>
<td>16%</td>
</tr>
<tr>
<td>Alive at 5 years</td>
<td>46%</td>
<td>5%</td>
</tr>
<tr>
<td>Alive at 7 years</td>
<td>39%</td>
<td>0%</td>
</tr>
<tr>
<td>Alive at 9 years</td>
<td>34%</td>
<td>0%</td>
</tr>
</tbody>
</table>

Table 4: Dr. Hoffer’s Cancer Patients Seen before the End of 1997 (71 Excluded)

<table>
<thead>
<tr>
<th>Group</th>
<th>Treated</th>
<th>Untreated</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Number</td>
<td>769</td>
<td>75</td>
</tr>
<tr>
<td>Alive at 1 year</td>
<td>72%</td>
<td>24%</td>
</tr>
<tr>
<td>Alive at 2 years</td>
<td>48%</td>
<td>12%</td>
</tr>
<tr>
<td>Alive at 3 years</td>
<td>37%</td>
<td>12%</td>
</tr>
<tr>
<td>Alive at 4 years</td>
<td>30%</td>
<td>8%</td>
</tr>
<tr>
<td>Alive at 5 years</td>
<td>23%</td>
<td>8%</td>
</tr>
</tbody>
</table>
of iodine daily.\textsuperscript{20} Ghent using 5 mg of iodine daily for a year was able to reverse fibrocystic breast disease in more than 90% of the women in the study.\textsuperscript{21} Flechas in a paper at the www.optimox.com website says that he is able to clear fibrocystic breast disease in women within a period of 3 months using 50 mg of iodine daily.\textsuperscript{10}

Other possible functions of iodine include: helping to regulate mood, preventing cancer (especially breast, ovarian, uterine, prostate and thyroid gland cancers), helping to regulate blood pressure, helping to regulate blood sugar (helping to prevent and treat diabetes), and helping to prevent abnormal cardiac rhythms. Dr. Abraham points out the cardiac anti-arrhythmic drug amiodarone is an iodine delivery system and that the therapeutic benefits are mediated by iodine while significant adverse effects result from the rest of the molecule. He believes that beneficial anti-arrhythmic effects can be achieved with iodine alone without the adverse effects of amiodarone.

With regard to cancer, in many areas of Japan, Japanese women who have one of the lowest breast cancer rates in the world, ingest more than 13 mg of iodine daily from seaweed without suffering any adverse consequences, according to Abraham’s research, and iodine may be an important factor in this low rate of breast cancer. Dr. Abraham further demonstrates that iodine tends to be antibacterial, antiviral, anti-parasitic and antifungal and that it enhances immune function. No microorganism has ever been found to be resistant to iodine. Furthermore, he suggests that suboptimal iodine intake in combination with overexposure to other halogens (like chlorine, fluoride and especially bromide) and other goitrogens (like perchlorate, a common contaminant of ground water) may contribute to various thyroid abnormalities commonly seen today, including hypothyroidism (underactive), hyperthyroidism (overactive/Grave’s disease) and autoimmune inflammation of the thyroid (Hashimoto’s Disease).

Dr. Abraham notes that research has shown that the thyroid gland prefers to utilize the iodide form of iodine, while other organs, such as the breast and ovaries, prefer the elemental form of iodine.\textsuperscript{10} Both of these forms are present in Lugol’s solution and a tablet form of Lugol’s solution known as Iodoral. Allergic reactions to the non-organic form of iodine as found in Lugol’s solution or Iodoral are either rare or non-existent, but allergic reactions to drugs containing iodine (organic compounds containing iodine) are fairly common. For example, many people are allergic to iodine containing imaging dyes. Abraham points out in his preface to Dr. David Brownstein’s book Iodine: Why You Need It, Why You Can’t Live Without It: “The severe side effects of these drugs are blamed on inorganic iodine although studies have clearly demonstrated that it is the whole molecule that is toxic, not the iodine released from it.”\textsuperscript{26}

Iodine’s role in helping to prevent and treat cancer needs much more exploration and research but there is suggestive evidence that it plays a role in preventing and/or treating cancer (especially involving the thyroid gland, breasts, prostate, ovaries and uterus).\textsuperscript{10,27,28}

Iodine deficiency predisposes to breast cancer and high fat diet predisposes to iodine deficiency.\textsuperscript{29} Japan and Iceland have high iodine intake and low goiter and breast cancer rates, just the reverse occurs in Mexico and Thailand.\textsuperscript{30} Iodine protects against estrogenic effects in breast cancer.\textsuperscript{17,27} Thyroid hormone therapy contributes to breast cancer in iodine deficient women.\textsuperscript{28} Female rats require 20 to 40 times the amount of iodine needed to control breast cancer and fibrocystic disease than to prevent goiter.\textsuperscript{27}

When iodine was used in dough during the sixties, one slice of bread a day contained the RDA of 150 mcg. The average iodine intake was > 700 mcg daily and the breast cancer risk was 1:20.

With the replacement of iodine in bread dough by the goitrogen bromine in the early 1980’s, the average iodine intake was reduced below the RDA of 150 mcg and the rate of breast cancer increased to 1:8 (absorption of iodine from bread is much better than from iodized salt). This seems to me to be a totally unrecognized correlation that may be causal in nature. It would not be the first time that a disastrous public health decision was made. As a result of exposure to goitrogens, including the addition of bromine to all baked goods, the amount of iodine needed to counteract the effects of these goitrogens has drastically increased. This is one of the main reasons that the average person needs so much iodine for optimal functioning. One researcher commented that to overcome the effects of goitrogens in the food chain such as bromine in dough, daily amounts of iodine ingested in Japan would be necessary (referring to the 13 mcg daily in Japan).\textsuperscript{41}

In supplementing with higher doses of iodine as with Lugol’s or Iodoral, bromine and other goitrogens that are stored in the body may be mobilized and result in significant adverse effects. So, the iodine dose must be no more than the body can tolerate in terms of detoxification of released bromine and other potentially toxic substances. Strategies for safely administering iodine include the patient taking sufficient water, unrefined salt, selenium, magnesium and vitamin C. Resources for more information about this strategy can be found in the resources mentioned previously (Lynne Farrow’s book, The Iodine Crisis, my lecture on unrefined salt and iodine and Dr. Brownstein’s book(s), as well as the websites mentioned previously).

Research in this area is beginning to pick up worldwide. A website with more information about the relationship between insufficient iodine and breast cancer is: http://www.breastcancerchoices.org/. Given all of this information about breast cancer and some epidemiologic evidence relating to higher incidence of prostate and thyroid cancer in iodine insufficient areas, it seems reasonable to consider that suboptimal iodine levels may play a role in many, if not all cancers, and that Gerson was correct in giving all of his cancer patients iodine as Lugol’s solution. All things considered, I think that the therapeutic use of iodine/iodide has the potential to drastically change how medicine is practiced today, including prevention and treatment of cancer.

Mirko Beljanski’s Products

Four supplements that I have used extensively in my practice for cancer patients since 1999 were developed by the late Mirko Beljanski PhD, a molecular biologist who was born in Yugoslavia, but spent most of his adult life doing biological research in France. He did extensive research on RNA and DNA and developed a theory about cancer that is quite profound. Information and books about his work are available at two websites: www.beljanski.com and www.natural-source.com. Much of his work is summarized in his monograph, The Regulation of DNA Replication & Transcription.\textsuperscript{42} A recent book by Morton Walker Cancer Cause Cancer’s Cure is a nice summary of Dr. Beljanski’s life and work. It shows how he was far ahead of his time in many ways.\textsuperscript{43}

Dr. Beljanski’s basic research on RNA and DNA led to the development of a theory about a mechanism for the development of cancer. During the 1960’s and 70’s, the predominant theory for the development of cancer was that mutations in the primary structure of DNA in certain classes of genes, namely proto-oncogenes, tumor suppressor genes and DNA repair genes resulted in malignant changes in cells. Generally, the more mutations in these genes, the more aggressive would be the cancer cell. This change in the primary structure of
Beljanski’s Theory is that cancer DNA differs from normal DNA in its secondary structure, rather than only its primary structure.

The primary structure of DNA relates to how the nucleotides of each strand line up with each other.

Mutations = modifications in one or more nucleotides

Secondary structure of DNA relates to how the two DNA strands line up via hydrogen bonding.

Intact hydrogen bonds

Beljanski’s Theory is that cancer DNA differs from normal DNA in its secondary structure, rather than only its primary structure.

DNA involved mutations; a change in one of the possible four bases that were present in a pattern along the two DNA strands of the double helix structure of DNA.

Beljanski’s new idea was that rather than just changes in the primary structure of DNA, changes in the secondary structure of DNA might contribute to the development of cancer. The secondary structure of DNA relates to the hydrogen bonding that takes place between the two strands of DNA. He suggested that carcinogenic substances could interfere with some of the hydrogen bonds between the two strands of the double helix, causing the formation of large loops between the strands. When this occurred, the DNA became destabilized, increasing the risk of a cell becoming cancerous. His theory is illustrated in Figure 7.

He reasoned that if carcinogenic substances could interfere with hydrogen bonding, perhaps he could find anti-carcinogenic substances that might help to counteract this action or reestablish the DNA (so-called bolt substances). He began to search for such substances, using a test he developed (The Oncocist) that could be used to determine if a substance was either carcinogenic or anti-carcinogenic.

He was able to find two anti-carcinogenic substances: extracts from the herbs Pae Pereira and Rauwolfia Vomitoria from the Ayurvedic herb Indian snakeroot.

He extensively tested extracts from these two herbs (Pae Pereira and Rauwolfia Vomitoria) and found that each of them had selective damaging effects against a wide variety of cancer cells in vitro, including liver, thyroid, brain and breast. Giving these compounds to mice with cancer, he showed that these agents selectively destroyed cancer cells without harming normal cells and also that they were synergistic with at least some chemotherapy drugs. He found that the Rauwolfia Vomitoria extract (also called BC-8) was slightly better in hormone related cancers, while Pae Pereira (also called PB -100) was capable of crossing the blood-brain barrier and therefore might be helpful in brain cancer.

He was able to demonstrate clearly that Pae Pereira could penetrate and damage glioblastoma cancer cells while not penetrating normal brain glial cells, and had several other papers published on the effects of Pae Pereira on brain cancer cells. In another publication, he showed that both Pae Pereira (PB-100) and Rauwolfia Vomitoria (BG-8) were active against human melanoma cells but not non-malignant fibroblasts.

More recent research at Columbia University’s Holistic Urology Department showed each of these herbs were active against prostate cancer cells in vitro and in animals. Both the Pae Pereira and Rauwolfia Vomitoria supplements are available commercially from Natural Source, the supplement company owned by Dr. Beljanski’s daughter Sylvie Beljanski, and can be obtained as nutritional supplements to support cancer patients. The dosage we generally use with each of these supplements is about 2 capsules of each 3 times daily. Natural Source also has combinations of these extracts in one capsule.

In addition to his work with anti-cancer herbal extracts, Dr. Beljanski had two more lines of research that led to potential breakthroughs in the management of cancer patients. The first one involved enhancing normal white blood cell and platelet formation, the second involves inhibiting damage from radiation. Beljanski discovered that normal cells undergoing replication require RNA entities that he called primers, which improve the efficiency of the replication process. The RNA primers interact with the newly formed DNA strands to bring about enhanced replication of DNA. He found a way to produce large quantities of these RNA primers, using a strain of non-pathogenic E. Coli. These RNA primers had profound effects on some of the cells in bone marrow. In a published paper in 1979, Beljanski was able to show that RNA primers could be used to drastically increase the production of all normal white blood cells and megakaryocytes, which resulted in an increase in platelets. However, the RNA primers did not increase red blood cells in rabbits. In 1991, Beljanski and his colleagues reported on the successful use of RNA fragments in two patients with non-Hodgkin’s lymphoma.

A pilot study at the Cancer Treatment Centers of America utilized the RNA fragments in patients receiving chemotherapy. Cancer patients with solid tumors that experienced post chemotherapy thrombocytopenia with a nadir of $< 80,000$ platelets/mL were eligible for this clinical trial.

Ten patients per group received 20, 40, or 60 mg as a starting dose. Subjects self administered RNA fragments sublingually on an every other day schedule while undergoing chemotherapy. The dose was escalated in 20 mg increments to a maximum dose of 80 mg if the nadir was $< 80,000$ platelets/mL at the start of the next cycle. Patients receiving E. coli RNA fragments demonstrated a more rapid recovery in platelet count and higher nadir platelet count. None of the patients receiving the E. coli RNA fragments required a chemotherapy dose reduction due to thrombocytopenia. The optimal dose for minimizing chemotherapy induced thrombocytopenia was 80 mg. Patients receiving myelosuppressive chemotherapy experienced an improvement in the platelet nadir and shorter recovery time when receiving concurrent E. coli RNA fragments, when compared to patients who received yeast RNA fragments. These data indicate that 60 and 80 mg doses of E. coli RNA accelerated platelet recovery. Although the paper indicates that further studies are indicated, no such studies have been planned to date. The RNA Primer supplement is currently available from Natural Source as a sublingual supplement of 20 mg (powder in cone) and is called Real Build.

The final Beljanski nutritional product, potentially helpful to cancer patients evolved from a different phase of Beljanski’s research related to protection against radiation fibrosis and correction of enzyme dysregulation that occurs in many chronic conditions including cancer. It is a...
specially prepared form of Ginkgo Biloba that shows evidence of protection against damage from radiation and correction of enzyme dysregulation. It has been used as a nutritional supplement to help prevent abnormal scar tissue formation from irradiation or surgery. This product is available from Natural Source as Ginkgo V and the usual dose is 2 capsules 3 times daily. More information about this supplement is available from my Integrative Oncology for Clinicians and Cancer Patients document.\(^{19}\)

Perhaps the most famous patient who benefited from the Beljanski products was the late former French President Francois Mitterrand. During his term in office Mitterrand developed prostate cancer, which he kept a secret until the middle of his second term. By this time, the prostate cancer was so advanced that his prognosis was grim. His conventional physicians predicted that he would live only a few months. The country was preparing for early elections when Mitterrand decided to use the Beljanski’s products. Against all odds, his health began to improve and Mitterrand remained in power until the end of his term.

In the process, some powerful people became infuriated because some natural alternative treatment had thwarted Mitterrand’s prognosis and the opportunity for some of these people to seize power was also thwarted. So, when Mitterrand ultimately passed away about 18 months after he left office, the French government brutally shut down Beljanski’s laboratory and mercilessly persecuted him. He was accused of practicing medicine without a license and other similar charges. Unable to do what he loved and being blocked from leaving the country, Beljanski became ill and did not have access to his own products. He died in 1998. Around that time, with a pledge to her father that she would continue his work, his daughter Sylvie set up Natural Source in the US with the help of her mother Monique who had worked with Mirko for close to 50 years.

Today, the Beljanski products are still relatively unknown to most physicians including oncologists and many integrative practitioners throughout the world. They are being recommended in Europe by a handful of clinicians and are being used primarily in France and Belgium by a minority of cancer patients. In the USA, a few integrative physicians, including myself, have used them primarily with cancer patients. In my opinion, they have value and should be used as part of a total integrative cancer treatment program.

Other Nutritional Supplements

This paper has barely scratched the surface on the use of nutritional supplements to support cancer patients. I have chosen to emphasize certain supplements that have either been very controversial (most of the ones I discussed), not widely known among clinicians and ones that I thought could be implemented immediately to help patients. This is not to say that there are not many other nutritional supplements for which a great deal of evidence for benefits exists. These are seen in the books of Boik and Quillin mentioned in this paper as well as in books by Keith Block and many others. Among the areas that really deserve much more attention are the systemic use of proteolytic enzymes (as utilized by the late William Donald Kelly and Nicholas Gonzalez),\(^{5,6}\) the use of high doses of vitamin D3 to produce optimal serum levels; the use of vitamin K to help with utilization of vitamin D; vitamin A; various phytonutrients like sulforaphane from broccoli extracts; resveratrol; curcumin; various pre and probiotics and many, many others.

Salvestrols

Recently, I have become extremely interested in the CYP1B1 enzyme and how it converts natural occurring substances known as salvestrols to metabolites that induce cell death in cancer cells. The CYP1B1 enzyme is expressed in cancer cells, but not in normal cells.

Salvestrols are a subset of a class of plant compounds known as “phytoalexins”—that is, compounds produced by plants when they are stressed by fungal and/or insect attack (resveratrol is the best known of the phytoalexins). Resveratrol also fits the definition of a salvestrol, as it is a substrate of CYP1B1, and its metabolite, known as piceatannol, has apoptosis inducing effects, but is produced only in cells with significant 1B1 activity. Resveratrol is however unique in that in large amounts, it inhibits CYP1B1, and therefore doses greater than 50 mg should not be used in conjunction with other salvestrols. Since only the metabolites of salvestrols after being hydroxylated by 1B1 have apoptosis inducing effects, they have no effect on normal cells. They become active only when they meet the CYP1B1 enzyme in cancer cells. Since they are only produced by plants that are stressed by fungal and/or insect attack, they are present only in organically grown food plants. Salvestrols are also uniformly bitter, and so crop hybridization over the past several hundred years, which has progressively produced sweeter and less bitter fruits, vegetables, and herbs, has worked to reduce the presence of these compounds in the human diet, but they are now available in supplemental form.

More information about this subject can be found in Brian Schaefer’s book: Salvestrols: Nature’s Defense against Cancer.\(^{6}\) Also, a DVD of a lecture I gave on Salvestrols may be ordered from my website. My early experiences with this supplement has been promising and I hope to write about them in future articles.

There is a great deal of information about the use of supplements for cancer patients and this can be overwhelming for the patient as well as the clinician. The trick is to try to put all of this together in a comprehensive, personalized and manageable program for the particular cancer patient, utilizing all available information known about the patient and prioritizing a comprehensive program.

This paper contains updated, but abbreviated information on a number of supplements previously discussed in my paper: "Integrative Oncology for Clinicians and Cancer Patients."\(^{50}\)

References


Figures and artwork included by permission of the author.

---
