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Nutrients and Cancer: An Introduction to Cesium Therapy

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SARTORI, H E *Nutrients and cancer An introduction to cesium therapy* PHARMACOL BIOCHEM BEHAV 21: Suppl 1, 7–10, 1984.—A brief overview on the relevance in dietary factors in both development and prevention of cancer is presented. The pharmacologic properties of various food ingredients are discussed. Establishing of a special diet for the cancer patient is suggested In addition, avoidance of certain foods is recommended to counteract mucus production of cancer cells Evaluation of the nutrient content of certain diets in regions with low incidence of cancer has advanced the use of certain alkali metals, i e , rubidium and cesium, as chemotherapeutic agents The rationale for this approach termed the "high pH" therapy resides in changing the acidic pH range of the cancer cell by cesium towards weak alkalinity in which the survival of the cancer cell is endangered, and the formation of acidic and toxic materials, normally formed in cancer cells, is neutralized and eliminated

Antioxidants Cesium Diet Essential fatty acids Liver oils Minerals Oxygenation
Potassium Rubidium Sodium Vitamins

ONE to 1.3 million cases of new cancer are anticipated in USA for the year 1984. Cancer mortality is second only to cardiovascular disease as the most common cause of death in the USA and in most European countries. Squamous and basal cell skin cancer may contribute about 400,000 new cases, while lung and colorectal cancer may account for 139,000 cases, each compared to 116,000 for breast cancer of which 1,000 is projected for men. The remainder of cancers anticipated, in descending order, include prostate, uterus, urinary, oral, pancreas, leukemia, ovary and skin-melanoma. The mortality of cancer is estimated for this year at approximately 185 cases per 100,000 population. This is compared to 440,000, 431,000 and 423,000 deaths from cancer that have been reported for 1983, 1982 and 1981, respectively.

Treatment modalities of cancer include surgery, radiation and chemotherapy. In those cases where surgery was successful the body's own immune system was able to counteract the reduced amount of tumor tissue. Surgery is likely to produce metastasis without stimulation of the immune system. Radiation may cause damages to the organism, e.g., cancerogenicity of x-rays and other radiations, and their depression of the immune system is well known. Prolonged chemotherapy may cause severe to lethal side effect in some instances, and the use of hormones and interferon are useful only in very few cases of cancer. Conventional treatments to cancer treatment have produced 5-year survival rates which does not reflect the progressively gradual deterioration of the cancer patients, nor their suffering from various treatment related adverse reactions.

Alternate cancer therapies include Orthomolecular Eumetabolic approaches and Priore-radiation of cancer. The latter technique has been developed by Antoine Priore in France and has been described in detail elsewhere [3]. In brief, it generates a combination of radiations, in rotating plasmic solutions that are capable of penetrating living tissues for therapeutic purposes, without destroying biological systems. The innovative techniques employed in the device since the early 1960's have attracted scientific attention and research in following years of its introduction has demonstrated its efficacy in animal experiments, i.e., cure of cancer-bearing rats, attenuation of hypercholesterolemia in rabbits and survival of mice injected with fatal doses of trypanosoma equiperdum compared to corresponding controls This approach is directed primarily toward a stimulation of the immune system rather than the cancerous cells themselves, resulting presumably in an acquired immunity which becomes intense and is even transferable by blood transfusion.

Dietary requirements which may lead to cancer have been generally ignored. Various diets and eating habits appear to bear some significance to susceptibility as well as to prevention and/or treatment of cancer. The macrobiotic-related dietary approach of Michio Kushi [4,5] for cancer treatment focuses on the use of whole grains, e.g., 50% to 60% of daily intake, with locally grown vegetables, e.g., 20% to 30%, excluding potatoes, tomatoes, peppers, eggplant, and especially tropical fruits. This is complemented by 10% to 15% of daily food consumption of beans and seaweeds in addition to 5% miso soup and about 5% supplemental foods. The main difficulty with this approach is the necessity of complete compliance. The possible association of specific diet ingredients to cancer development, treatment and/or prevention is outlined below which then leads to the rationale of the use of alkali metal, i.e., cesium, as chemotherapeutic agent.

NUTRITION AND CANCER MUCUS

The cancer cell is known to produce large amounts of mucus and this in turn protects the cancer cells from the

TABLE 1

CANCER PROTECTIVE NUTRIENTS WHICH MAY REDUCE INCIDENCE OF CANCER

Substance/Compound*	Possible Mechanism of Action
Cesium and Rubidium	Raise pH in cancer cells and gene repair
Omega-3 Essential Fatty Acids Eicosapentaenoic acid and Docosahexaenoic acid	Repair membranes, enhance the immune system and prostaglandin synthesis
Carotene and Vitamin A	Decompose blocking mucus and enhance immune system
Selenium	Antioxydant and broadens electron donor capacity of cancer cell membrane
Vitamin C and Bioflavonoids	Enhance the immune system
Germanium	Oxygen carrier, interferon stimulator and gene repair
Vitamin D2 (Ergocalciferol)	Immune enhancer, precursor of tumosteron
Molybdenum	Membrane stabilizer, part of xanthine oxidase, which mobilizes iron from liver and of aldehyde oxidase necessary for fat oxidation
Zinc	Electron donor, antioxydant and immune stimulant
Magnesium	Enzyme activator, gene and membrane stabilizer
Nitriles	Broaden electron donor capacity of the cancer cell membrane, release of cancer cell inhibiting benzaldehyde and cyanide
Allicin and sinigrin	Natural cancer inhibitors
Taurine	Desalting substance that lowers sodium in cancer cells
Squalene	Precursor of dehydroepiandrosterone (DHEA) an anticancer, antiaging and antiobesity factor
Saponins	Membrane and gene stabilizing
Photonic Energy	Decomposes blocking mucus surrounding the cancer cells (are found in KIRLIAN positive raw vegetables and fresh vegetable juices, especially carrot juice)
Niacinamide	Slows down mitosis and the multiplication of cancer cells
Food Fiber	Reduces passage-time, decreasing the exposure of intestines, especially the colon, to cancerogens, binds toxic substances and cancerogens
B-complex vitamins, especially Riboflavin (Vitamin B2)	Required for cell respiration (esp B2) and catalysts for numerous enzymes
Vitamin E (mixed D-Tocopherols)	Antioxydant, membrane and gene stabilizer
Pantothenic acid	Stimulates adrenals and DHEA-formation
Folic Acid	Coenzyme with B12 and C for protein utilization, carbon carrier for heme formation and nucleid acid formation, thus, it normalizes gene formation of cancers It also stimulates the production of hydrochloric acid
Certain Amino Acids (Cystein, Arginine, Ornithine)	Stimulate the anticancer human growth hormone

*See text for the presence of these compounds in various food ingredients

immune system and from being penetrated by chemotherapeutic agents. It even protects against radiation if the layer of mucus is thickened up. Later this mucus can also be demonstrated in the blood, e.g , with the HLB blood test Use of certain agents help to dissolve the blocking effect of the mucus. This includes the use of beta-carotene which decomposes blocking mucoid proteins mediated by electrical charges It gets inactivated and decolored by the blocking mucoid The necessary dosage for optimal effect produces an orange-yellow tinge to the patient's skin Likewise, heparin inactivates the immune repelling and immune binding capacities of the mucoid proteins by electrical charges. Furthermore, compounds like bromelain, papain, Wobemugos®, bromelain or pancreatic enzymes will not only break down mucus but also destroy leukemic cells

It is recommended, therefore, to avoid all mucus-producing foods, e.g., all dairy products and flour products as well as all meat and flour, as opposed to whole grain and locally grown vegetables Food with high contents of sugar, alcohol, tropical fruits, refined carbohydrates, salt, sausages, bacon, may also increase the specific mucus production of cancer cells. The common practice of not eating other items with milk is of significant bearing in this respect because milk produces a mucus, it coats all the food, and prevents all the nutrients from being absorbed We have also been using EDTA for chelation therapy which has been shown to reduce incidences of cancer and heart diseases by 90% and 50%, respectively [1] Likewise, increased cancer incidence may result from consumption of eggs and certain fish, e g , lobster, shrimp and crayfish, due to their high content of nucleic acids which can be detrimental to the cancer patient Therefore, the elimination of these items from diet may conceivably reduce the incidence of cancer

VITAMINS, ESSENTIAL FATTY ACIDS AND FREE RADICALS

The Smithsonian Institute has done a study on the incidence of cancer in sharks They examined 25,000 sharks and found only one individual case with cancer. This suggests that the shark is most probably immune to cancer The shark

liver oil contains vitamins and other compounds with anticancer activity. This includes squalene which is also contained in cod liver and in olive oil. Squalene increases the polarization of the cell membrane and thereby may facilitate the action of immune system on the cancer cell. This compound is also a precursor for dehydroepiandrosterone (DHEA) which possess anticancer activity. Moreover, squalene has been implicated in the mechanism of Na accumulation by the cancer cell. For example, the high uptake of Na^+ by the cancer cell induces an electrical potential that defies the immune mechanisms. Thereafter, both blood forming organs and the blood cells show high content of Na^+ which can undergo desodification by squalene and certain sulphur amino acids, i.e., taurine and isethionic acid, found in shark oil. Lithium orotate can counteract Na^+ retention and effectively increases the monocyte and granulocyte counts. Certain vitamins, i.e., carotene and Vitamin A, are associated with low incidence of lung cancer. The excess of other vitamins, i.e., over 10 g of vitamin C/day, may enhance tumor growth in leukemias and similar cancers.

It appears that the foods with the most decisive effects on the reduction of cancer incidence in humans and in animals contain Omega-3 unsaturated essential fatty acids (EFAs) of oils, derived from linseed, chestnut, beechnut, soy, walnut, and wheat germ. In addition, soybean and wheat germ oils contain high amounts of Vitamin E Also rich in EFA are cold climate legumes like soybeans, azuki, black and navy beans, lentils and chickpeas, as well as cold water fish like mackerels, herring, cod, salmon and halibut, cold-water plankton and sea vegetables. In cold climate animals the eicosapentaenoic acid (EPA) is the immediate precursor of 3-series of prostaglandins, which are involved in protection of cellular functions, and prevent the formation of 2-series prostaglandins, which are cancerogenic.

Careful selection of oils should be considered. This is due to high contents of EFA in cod liver oil and other fish liver oils and potential toxicity of Vitamins A and D. The use of margarine or hydrogenated oils, non-cold pressed polyunsaturated oils, shortening, bacon, grease, non-dairy creamers, egg-substitutes, commercial mayonnaise and salad dressings, as well as tropical oils like coconut oil, palm oil or cottonseed oil should be avoided. Excess of polyunsaturated compounds may be oxidized. This may drive cholesterol from the bloodstream into the liver and body cells, and promote the release of free radicals, which are carcinogenic They also cause a significant elevation of uric acid (indicating destruction of cellular nucleoprotein), cause iron deficiency and anemia, liver disease, intestinal damage and obstruction, amyloidosis (abnormal waxy deposits in tissues), hypertension, gallstones, and increase the incidence of atherogenesis (formation of artherosclerosis). Free radicals formation also accelerates aging and promotes monoclonal proliferation through mutation causing atherosclerosis. To protect against excess polyunsaturates, the use of adequate amounts of antioxidants, i.e., Vitamin E, selenium, plus biotin, Vitamin B12, and Vitamin A, should be considered for several months. The use of *cold* pressed vegetable oils should be considered because heated vegetable oils may accelerate cancer induction due to acrolein formation In subtropical or tropical climates the use of a "southern oils" is recommended. These include light and dark sesame oil, sunflower, safflower, corn oil, peanut oil, and especially virgin olive oil which contain small amounts of the anticancer shark factor squalene.

The foregoing observations suggest the use of cod liver oil, to increase EPA intake and to administer in addition 6000 U of Vitamin A and 600 U of Vitamin E. Other supplements will be wheat germ oil to provide energy from ocatacosanol and to improve physical fitness. Sesame oil may be advantageous against various bleedings, i.e., nose, gastrointestinal and gynecological bleedings. The supplement EPA can be given as concentrate or by consumption of rich EPA food which may be beneficial in certain heart, blood vessel, bowel and immune diseases as well as cancer. In temperate climates the caloric intake from EFAs should be approximately 2% to 3%. Furthermore, gamma linoleic acid from evening primrose oil has been found—via synthesis of the series-1 prostaglandins, most notably prostaglandin El (PGEl)—to decrease elevated cholesterol levels, lower blood pressure, inhibit thrombosis and to normalize cancer cells.

OXYGENATION

It is generally assumed that healthy cells resist becoming cancerous if they are provided with adequate nutrients. Insufficient supply of a given critical nutrient may lead to or facilitate cancer induction. The same is true of the amount of oxygen reaching the cells since low cellular oxygen levels may result in anaerobic conditions which will further cancer development. The lack of oxygen has long been suspected in carcinogenesis because it leads to an anaerobic metabolism where essentially glucose is converted into lactic acid and the pH of the cancer cells becomes acidic. This creates an anaerobic metabolic condition and the acidic pH developed may cause breakdown of RNA and DNA and damage the cellular control mechanism involved. The development of acidic toxins usually will lead to the destructions of cell structures. Therefore, reversing this condition requires adequate oxygenation. There are certain elements, i.e., germanium, which may prove beneficial for cellular oxygenation. Germanium possesses 8 valences and therefore can carry 4 atoms of oxygen, and may therefore provide more oxygenation needed for the cancer cell, to evoke anticancer effect. Ginseng normally grows only on germanium rich soil and should provide a good source for this phenomenon However, the use of soil antibiotics in homegrown ginseng may interfere in the production of an effective ginseng due to its lack of soil derived germanium.

Certain antioxidant in food preservatives, e.g., butylated hydroxytoluene, butylated hydroxyanisole, and 5, 6-benzoflavone, may possess anticancer activity Ornithine, arginine and other amino acids stimulate human growth hormone secretion, and thus enhance the immune system and suppress prolactin production.

INORGANIC COMPOUNDS AND ELEMENTS

The presence of certain elements in diet is as important as the choice of diet for reducing the incidence of cancer and even in the management of the cancer patient. For example, selenium deficiency has been associated with increased cancer incidence. Other elements with some anticancer activity include molybdenum, zinc, magnesium and germanium.

Brewer [2] analyses of reports dealing with certain regions of the world with low incidence of cancer has motivated his rationale for the high pH therapy for cancer. This was primarily based on the presence of two alkali metals, i.e., rubidium and cesium, in high amounts in food being consumed in these areas, e.g., Hopi Indian territory in

Arizona, Hunza-Land in North Pakistan, volcanic areas in Hawaii, Austria and in selected regions of Kenya and Brazil This represents a novel approach in cancer chemotherapy based on changes in cancer cell pH and possible inactivation of ionic hydrogen of the tumor cell to reduce acidity This approach has been referred to as "high pH" therapy A combined effect of low pH and high body temperature has been also suggested in cancer treatment and termed the "low pH" therapy Both pH therapies are briefly outlined below, the low pH therapy was devised by Von Ardenne [8] and the high pH therapy by Brewer [2] Both have been shown to be effective therapeutic measures for the treatment of cancer in laboratory animals and humans

Low pH Therapy

In this therapy, glucose is injected into the blood stream As a consequence the cancer cell pH drops to the 5 5 range The patient is then placed in a chamber heated to 106°F for 1 to 6 hrs [8]. Diathermy is also applied over the tumor area which, in the absence of a blood supply, will cause the temperature of the tumor mass to rise to over 109°F At these high temperatures the life of cancer cells is observed to be very short. An apparent drawback to the therapy is that a case of severe toxemia may result for the leakage of acidic and toxic material from the tumor masses [8]

High pH Therapy

The rapid uptake of cesium and rubidium observed for cancer cells is the theoretical approach of high pH therapy [2] This therapy has been tested using CsCl or Cs_2CO_3 in conjunction with the administration of ascorbic and retinoic acids, zinc and selenium salts. The weak acids when absorbed by the tumor cells have been shown to enhance the negative potential gradient across the membrane Zinc and selenium salts when absorbed on the membrane surface act as broad and moderately strong electron donors These acids and salts have been shown in mice to drastically enhance the uptake of cesium and rubidium ions For treatment of cancer patients, the administration of 6 to 9 g of CsCl or Cs_2CO_3 for several days is believed to be tolerable and sufficient to raise the pH in the tumor cells to weak alkaline of approximately pH 8 where the life of each cell is short. In addition, the presence of cesium and rubidium salts in the body fluids are expected to neutralize the acidic and toxic material leaking from the tumor mass

Results from both animal experiments, mainly those of Messiha [6], and these of ours in limited clinical trials in humans in our clinic [7] are indicative of a high success rate of Cs-treatment in cancer therapy

Thus, both dietary factors and selected elements and vitamins may play a more significant role in the pathophysiology of certain cancers than has been previously accounted for Moreover, changes in dietary habits may have a lasting effect on protection against cancer development and its progression

To conclude, the author presents a list of cancer protective nutrients and their main functions and importance as outlined in Table 1

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