Image Awareness
Wellness Institute
Cancer and nutrients

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Introduction

Cancer was once a disease which confined itself mostly to older people, but this has changed rather dramatically over the last half century. This writer feels that the change has resulted from increasing exposure to toxins in the environment and a deterioration in the overall quality and quantity of the nutrient intake of the average individual.

This newsletter will focus on some basic nutritional issues which relate to the development of cancer. The focus will be at the cellular level and the nutritional environment which exists there, since cancer is a disease which begins with abnormal development within a single cell.

Bruce Lipton in the *Biology of Belief* wrote, "when the cultured cells you are studying are ailing, you look first to the cell's environment, not to the cell itself for the cause....When I provided a healthy environment for my cells they thrived; when the environment was less than optimal the cells faltered. When I adjusted the environment, these 'sick' cells revitalized." (p.50)

Sir Robert McCarrison was a British physician who did nutritional research in India in the early 1900's. McCarrison was particularly impressed with the diet of the Hunza people. These people raised their crops and livestock with the aid of heavily mineral enriched glacial runoff coming from the Himalaya mountains.

The diet of the Hunza was simple but nutrient rich. These people lived primarily on whole wheat flour, clarified butter, curds, buttermilk, sprouted pulses, fresh fruits and vegetables and meat about once a week.

McCarrison was so impressed with the health of these people that he made their diet the standard diet for his laboratory rats. Remarkably, he never saw a case of cancer while working among these people and none of his rats on this diet ever developed cancer.

A modern American could find these same foods in the supermarket, but there is a good chance the health result would not be the same due to a deterioration in the quality of the foods.

References:

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Omega-3 and Cancer

The quality of the fat in the diet plays a major role in cancer development. Maynard Murray examined 900-1,000 sperm whales and 3,000 seals for malignancies between 1942 and 1945. These animals consume a diet very high in omega-3 fatty acids. The account reads, "No malignant tumors were found, and there was no pathology in their arteries and joints."

There are many potential action paths by which omega-3 fatty acids can work to prevent cancer. One is the suppression of highly inflammatory arachidonic acid. Another is alteration of estrogen metabolism leading to less carcinogenic forms of estrogen. Omega-3 fatty acids also decrease production of free radicals and decrease the inflammatory response. These beneficial fats also improve membrane fluidity, insulin sensitivity, gene expression, and intercellular and intracellular communication.

By contrast, the omega-6 fat arachidonic acid has been shown to block apoptosis or suicide by human prostate cancer cells. When the activity of arachidonic acid was blocked, there was a massive die off of prostate cancer cells.

One of the benefits of omega-3 fats is that they can displace arachidonic acid in the membrane of cells reducing the risk of excessive activity of this potentially harmful fat.

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Ghosh, Jagadananda, and Meyers, Charles, Inhibition of arachidonate 5-lipoxygenase triggers massive apoptosis in human prostate cancer cells, PNAS, October 27, 1998; 95(22):13182-13187.

http://commons.wikimedia.org/wiki/File:Troitas._Galiza.jpg?fastcci_from=1152209 Fish image.

Phytosterols

The role of phytosterols in the prevention of cancer has recently come to prominence. Phytosterols are plant sterols similar to cholesterol. The most common are beta-sitosterol, campesterol, and stigmasterol. Experimental studies have shown that these substances offer protection against some of the most common cancers including those of the colon, breast and prostate.

Phytosterols play a key role in the structure and function of cell membranes. They play a key role in cellular pathways that regulate tumor growth and apoptosis or cell suicide. Phytosterols inhibit tumor cell reproduction or proliferation while they promote the suicide of cancer cells.

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Awad, Atif B., and Fink, Carol S.,, Phytosterols as anticancer dietary components: Evidence and mechanisms of action, J Nutr, 2000;130:2127-2130.

http://upload.wikimedia.org/wikipedia/commons/4/44/Mixed_Grains_%285662575503%29.jpg. Grain Photo.

Vitamin D and Calcium

A recent research paper by Garland and associates suggests that increasing the blood level of vitamin D to 40-60 ng/ml would result in 58,000 fewer cases of breast cancer and 49,000 fewer cases of colorectal cancer every year. Their research suggests that deaths from breast, prostate, and colorectal cancer could be cut in half by optimizing blood levels of vitamin D!

One of the hallmarks of malignancy and cancer growth is the failure of cells to maintain adherence to one another. They disjoin from adjacent cells leading to a loss of differentiation and transformation into cancer cells. Thus a breast cell separates from other breast cells, loses the characteristics of these cells and is transformed into a cancer cell.

Adherence of one cell to another is a critical function regulated by a substance called E-cadherin. This substance is induced by vitamin D.

As long as cells are in direct contact with adjacent cells their growth is inhibited. Vitamin D proves to be a key player in this important function.

It should be noted that diagnosis of cancers is highest in the winter months. Cancer growth has often been noted to slow down in the summer months if the vitamin D receptor is intact and functioning. This slowing of cancer growth has been called "involution."

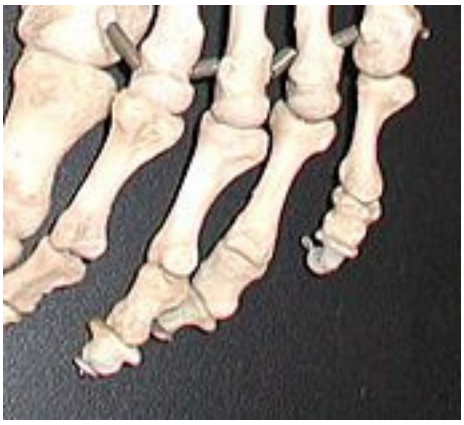
Vitamin D works with calcium to maintain adherence of one cell to another. One study looked at cancers of the breast, colon, lung, and blood cells. One group of women received 1400 mg of calcium and 1,000 IU of vitamin D. Cancer survival at a 4 year followup was 60% higher among women who were supplemented than among those who were not. The combination of the two nutrients worked better than either nutrient alone.

It would have been interesting to see what the results would have been with the addition of magnesium and optimization of vitamin D intake in this study.

Most of the calcium in the body is in the bones, but it is the calcium outside of the cells (extracellular) which is most important in cancer prevention. Lowering external concentrations of calcium has been shown to lead to hyperproliferation and poor differentiation of cells predisposing them to cancer development. If caught before this process has gone too far, normal cell function and differentiation can usually be restored by returning extracellular calcium concentration to normal.

Newmark and associates note that the average intake of calcium by adults in the United States is only 500-600 mg a day. They feel that optimal intake should be 1,500 mg for women and 1,800 mg for men. These suggested intakes are based upon the fact that calcium is usually poorly absorbed. Studies have shown that a properly chelated mineral can be absorbed as much as six times more efficiently than a non-chelated mineral. Supplementation of minerals in a chelated form is of particular value for difficult to absorb minerals like calcium, iron and zinc. NeoLife's double chelation technology is superior in this regard.

It should also be noted that high levels of calcium alone can induce a magnesium deficiency. I once talked to an individual suffering terrible muscle cramps. His physician supplemented him with calcium and the cramping problem became worse. The



addition of magnesium completely resolved the cramping problem.

Magnesium has potent anti-cancer activity just like vitamin D and calcium. Increasing magnesium intake was shown to reduce the risk of colorectal cancer in women by about 40% in one fairly recent study.

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Garland, et al., Vitamin D for cancer prevention: Global perspective, *Ann Epidemiol*, 2009;19:468-483.

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http://commons.wikimedia.org/wiki/Bones#mediaviewer/File:Foot_bones.jpg Bone photo.

Vitamin C and Sugar

Vitamin C and sugar are twins. Most life on earth manufactures its own vitamin C from glucose or sugar. A few creatures like man, apes, the guinea pig and a fruit eating bat do not synthesize their own vitamin C. Because vitamin C is manufactured from sugar in nature the molecular structure of the two compounds is almost identical.

These two compounds are transported about the body by the same mechanism. They also compete with one another for transport. Thus if the intake of sugar is high, as it is in most western diets, tissue levels of vitamin C can be depressed.

Cancer cells love sugar and greedily take it up. Sugar intake increases levels of a substance called IGF-1 associated with increased insulin levels. Lower levels of IGF-1 and insulin are associated with reduced risk of cancers and diabetes. Insulin and IGF-1 are also important growth factors for many cancers.

The IGF receptor is a virtual necessity for cancer growth. Renato Baserga of Thomas Jefferson University learned in the late 1980's that shutting down the IGF receptor in mice leads to strong inhibition if not total suppression of tumor growth. Shutting down this receptor is particularly lethal to tumors that have metasized or spread from a location somewhere else in the body. Downregulation of this receptor leads to massive suicide of cancer cells.

While sugar appears to have properties which promote tumor cell growth and the development of cancer, vitamin C, in contrast, appears to inhibit cancer development.

The possibility that vitamin C might be beneficial for cancer victims was first suggested by Linus Pauling and Ewan Cameron in the 1970's. They gave 1000 end stage cancer patients vitamin C and noted that survival time increased from an average of 50 days to 210 days.

In the early 1990's Gladys Block noted that a higher intake of vitamin C conferred a two-fold protective effect against development of cancer compared with individuals with a lower intake.

In 2006 Sebastian Padayatty reported on the use of intravenously administered vitamin C as a cancer therapy. He noted that oral dosing with 18 grams of vitamin C per day achieves a maximum blood level of only about 220 µmol/L. Giving the same dose intravenously results in a blood level 25 times higher. A larger dose over 50 grams per day can result in blood levels of 14,000 µmol/L. Padayatty points out that vitamin C becomes toxic to some cancer cells at 1,000 µmol/L but does not appear to be harmful to normal cells.

Sugar has a short half life in the blood. When large quantities of sugar are consumed, blood levels rise rapidly triggering a release of insulin which causes a rapid drop in blood sugar sometimes resulting in low blood sugar or hypoglycemia.

At higher levels of oral intake vitamin C also has a short half life. Hickey and Roberts suggest that the half-life of vitamin C in the blood is about 30 minutes. This means that a single large dose will provide optimal activity for less than six hours. The writers note that "A single megadose will provide only a fraction of the potential benefit of split or slow release doses."

This bit of information is probably critical for anyone who wishes to supplement with vitamin C to determine if it will benefit cancer, particularly if dosing orally. It is not a bad idea to use both vitamin C and B complex in continuous release forms in order to optimize blood levels of these water soluble nutrients.

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Conclusion

Dr. Arthur Furst developed oral chemotherapy for cancer. His career in cancer research began when he was asked by the government to clarify the issue of why some studies of butter yellow showed it to be a carcinogen while other studies did not indicate any problem. Butter yellow is a food dye once added to margarine to make it look like butter,

Dr. Furst found that butter yellow was indeed a carcinogen. He could administer it to rats and he could predict the day they would develop cancer and the type of cancer they would manifest. This aspect of his research received world-wide publicity.

Dr. Furst also learned that he could supplement his rats with specific nutrients and they could consume butter yellow on a regular basis without developing cancer.

This part of his research never received publicity, but it eventually led him into development of a number of supplements designed to enable the body to cope with carcinogens. Among the supplements he developed were Betagard, Carotenoid Complex, Flavonoid Complex, and Cruciferous Plus. Today many people have heard of these types of supplements, but the ones he developed are still available and are superior to most of what is available in the marketplace.

Dr. Furst's research on butter yellow has been duplicated by many researchers with many other toxic substances. The bottom line is that toxic substances contribute to the development of cancer and nutrients are the primary mechanism by which the body attempts to cope with toxic exposures.

I once asked Dr. Furst how one was to possibly retain good health when all the produce in the supermarket was being grown with the use of toxic chemicals. He replied that he did not know how people retained their health without supplementing with B complex vitamins. The point here is that obtaining a continuous supply of essential nutrients is one of the best investments and individual can make for prevention of cancer in the toxic world in which we find ourselves.

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