New Horizons in Non-Toxic Cancer Therapy: Beta-Carotene, Lithium Orotate, Anavit, Bromelaine, Benzaldehyde, Tumosterone, DHEA, and Ascorbate

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INTRODUCTION

Only four years have passed since the McGovern Committee (1978) of the United States Senate overtly expressed reservations over the prevailing and misleading priorities in cancer therapy and research. However, control of this disease has not significantly improved since then or since 1955 for that matter.

INTERFERON

Interferon research has been stimulated by such observations and it does qualify as a non-toxic treatment which can be carried out for an unlimited time at any stage of the disease. With the orthodox, toxic chemotherapy and radiation approaches we have the situation of the disease outliving the possible duration of therapy itself. It appears that the initial hope surrounding interferon therapy however will have to be generally reassessed. Interferon appears to inhibit the replication of viruses in cells which have received the interferon signal and it remains difficult from such action to understand why interferon acts in a tumor situation in an inhibitive manner. Does it stop the transmission of LDH - positive subcellular oncogenic particles known to be essential for metastization? We should note in this connection that the spread of tumor cells alone is not sufficient to produce metastases!

Cell bound zinc carriers, like zinc orotate and zinc aspartate, are also known to stop viral replication in cells and to inhibit the activity of thymidine kinase. The antitumor effect of such zinc compounds appears to be about in the range of what is reported for interferon; however, the latter is extremely more expensive.

Beta-carotene is a very inexpensive and in my opinion absolutely essential component of effective cancer therapeutics. Like embryonic cells, tumor cells produce a mucoid substance with shield-like, HCG-like properties which repel cell-bound defense immunity. Furthermore, this oncogenic mucoid in the blood stream appears to blind transformed lymph cells where the mechanism of this blocking effect appears to be electrical in nature; rather, than of chemical specificity as shown by the work of Hause, Patillo, and Mattingly (1970). Moreover, this oncogenic mucoid shield possesses in its amino acid groups hydroxyl-amines which render it alien to the host's recognition system and substantially retards its excretion by the kidneys resulting in the maintenance of high levels of this blocking factor in the organism.

It appears that one of the best ways to decompose this blocking mucoid protein is exposure to excessive electric charges which inactivate it's immune repelling or blinding capacities. As Jacques (1979) has argued and shown, heparin is known to work by such an electrical mechanism and we have successfully applied it to cancer patients for this reason. The problem with long term heparinoid application is that it needs to be injected and may involve liver disturbances.

BETA-CAROTENE

Lewis (1977) observed that beta-carotene was also found to mediate such electrical charges and since beta-carotene becomes deposited in tissues and fluids of the patient as when taken with fatty emulsions like cream, it appears to this investigator to work around the clock to inactivate the above mentioned blocking mucoid. This is extremely important since the reformation of this blocking mucoid takes only some ten to twenty

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minutes. We have found that beta-carotene has a drastic and highly significant unblocking effect. It gets inactivated and decolored by the blocking mucoid and it is therefore quite necessary for the patient to consume a quantity of beta-carotene sufficient to produce a yellowish stain to the skin; otherwise, the carotene cannot be considered to dominate the blocking mucoid protein substance.

Effective beta-carotene concentrations significantly increase the consumption of naked nuclear lymphocytes and facilitate the take of BCG test reactions as well as of therapeutic BCG grafts. The merits of carotene therapy in cancer patients have already received the attention of the mass media, but have not yet been seriously considered by community of orthodox oncologists. We introduced the beta-carotene therapy into cancer therapy routine in early 1972, just 10 years ago.

LITHIUM THERAPY

In more recent months I was quite amazed to find articles in the medical press demonstrating the profitable effect of lithium therapy in the activation of White Blood Cell production; especially, where suppressed by toxic, chemotherapy: here lithium carbonate was used. Since Hamilton's (1969) findings were reported we have employed lithium in cancer therapeutics in Germany. Hamilton (1969) reported at a Baden-Baden Cancer Congress many years ago the profitable effect of lithium succinate (Verdun) to dry pleural effusions, by replacing Na with Li and counteracting water retention.

These days we use lithium orotate for this purpose at dose levels of 450 mg per day and of course with the orotate compound there is no need to check the blood serum Li levels in contrast to the therapy with lithium carbonate (Lyman, 1980). We find the lithium orotate very effective in increasing the granulocyte and especially the monocyte counts. Monocyte counts may actually increase up to 500-600/cc^3. It is difficult to understand why lithium boosts bone marrow function the way it does, but it is quite a real effect. The lithium orotate counteracts endocellular sodium retention and perhaps this mechanism is involved.

PANCREATIC ENZYME PREPARATIONS

Pancreatic enzyme preparations are known to *destroy specifically leucemic cells* when applied intravenously. This specificity also seems to be determined by different electrical membrane properties of the malignant cells. Normal and living cells largely repel pancreatin which is the reason why it is very poorly absorbed from the intestine. However, plant enzymes like bromelain get reabsorbed to a very high degree, up to 90%, when taken on an empty stomach.

BROMELAIN

As Taussig (1975) has shown, it is especially the glycoproteolytic fractions of the bromelain enzymatic complex, as well as fractions active in decomposing prostaglandin E2 and thromboxane, that are especially active factors in cancer therapeutics. These factors are relatively labile and demand a careful extraction procedure. Prostaglandin E2 inhibits the antimalignant activities of the macrophages and monocytes. Thus, like Beta-carotene, bromelain - which is carefully prepared - also has a deshielding effect on tumor cells, but on an enzymatic basis.

BENZALDEHYDE

By the summer of 1970, we find Dean Burk expressing his opinion that both cyanide and benzaldehyde are the active antimalignant principles of the mandelonitriles (e.g., the controversial laetrile being such an example). It appears that an irrational, anti-laetrile climate in some circles resulted in a failure of the fuller and more adequate exploration of the benzaldehyde effect; especially, in conjunction with a broad band, biological medicine intervention in cancer treatment. We also neglected in our own research the study of the benzaldehyde effects; instead, turning our attention to synthetic, non-sugar mandelonitriles.

Subsequently, Japanese workers, Kochi and Takeuchi (1980) found that active anti-cancer principle of figs was a benzaldehyde. It also appears that fig lumps were reported in the Bible as being curative for exophytic cancers; which is of historical interest in this context. These Japanese investigators have subsequently presented extensive pharmacological and clinical data concerning their initial discovery and we have also collected clinical data confirming their work. It appears that benzaldehyde is one of the most valuable anticancer substances which is currently and practically available.

The closely related substance, acetaldehyde (5% in alcohol; 25ml/d) has been routinely applied in our clinic for the treatment of melanotic melanoma since 1977 in the context of the so-called Ehrenfried Regimen for the treatment of melanoma. For this indication, acetaldehyde is clearly superior to benzaldehyde. Under present investigation is the question of whether this may also be the case for prostate cancer and even larger tumors.

Benzaldehyde has been shown experimentally to decrease drastically the uptake of thymodine and

adenine, both with SV-40 transformed cells and transplantable cancer cells. The concentration of amino-acids and aminobases in these cells decreases, but the concentration of tryptophane increases which is a typical sign for reduced malignancy. Normal cells are not affected, and the formation of ATP is decreased in cancer cells with no toxic side effects being noted whatsoever.

The clinical data show that numbers decrease in volume, that the LDH enzymes drop sharply; that the BSR decreases; that life duration of the RBC increases; that latent hemolysis decreases; that hemoglobin levels increase; and that there is a significant effect against tumor-conditioned pain. Furthermore, benzaldehyde has direct unblocking characteristics at a dose range from 200 to 1400 mg/day orally or i.v. (perfusions). No side effects have been noted with the exception of a higher need of the myocardium for thiamin and for transit-calcium (ca-orotate). C^{14} labelled benzaldehyde shows that this substance is connected to the cell membrane and especially the mitochondrial membranes, and that effects of redifferentiation are also observed (Kochi and Takeuchi, 1980).

From our observations we conclude that the least we can expect is a paralytic effect on tumor growth which can be carried on for an indefinite period of time. The arrest of the tumor progression permits an intervention with a scientific immunotherapy approach to arrest the disease itself. This takes time: about eighteen months on the average. When the tumor is relatively large the therapy with benzaldehyde, especially where dosage is insufficient, may result initially in the activation of tumor growth. This paradoxical influence was observed both by Japanese and German workers. It appears to me that this paradoxical effect of stimulating tumor growth under the conditions just specified, may be due to the partial inhibition of the tumor forming cells which then throws up tumor enhancing substrate acted upon by the remaining tumor forming cells and a rebound surge results in the residual cell population not sufficiently suppressed or affected by the benzaldehyde treatment. Benzaldehyde is relatively inexpensive; and must itself be given in a stabilized form. It is not possible to administer sufficent quantitites of benzaldehyde by giving amygdalin, laetrile or other mandelonitriles alone!

TUMOSTERONE

As for surgery, radiation and chemotherapy, they may be expected to yield a "cure-like" remission only when these procedures are supported by the "tail wind" of a well functioning and lasting immune defense capacity of the host. In our concentration on the invasiveness of the cancer we sometimes forget, as did Pasteur, of the greater importance of host resistance in such a disease equation. This principle also holds for benzaldehyde treatment; however, unlike toxic, chemotherapy, benzaldehyde even enhances and unblocks or releases the immune mechanisms to yield a more synergistic and integrated therapeutic strategy! It is interesting to note in passing that in the 1920s the American, Edgar Cayce in his own way had predicted that the ultimate control for cancer would come from the bitter almond principle; the benzaldehyde fraction! However, I am confident that the concept of tumosterone - which I will discuss below - will carry us even further than even Cayce had ever imagined.

Klemke (1977) discovered *tumosterone* and showed it to be a well defined steroid functioning as an endiol and connected to a tetrahydrofurane which is known to have a high affinity to cellular endoplasmic reticular structures as well as to the nuclear membranes. Tumosterone seems to develop out of thymosterine, the "grandfather" of which is ergocalciferol. There appears to be important evidence that adrenal function is related to the course of malignant disease states and renal hypertension may be related to spontaneous regressions of cancer as well, as shown by the work of Schirrmacher (1978). Characterologically aggressive women suffering from breast cancer, moreover, appear to have better life expectancies than shy, timid individuals which may also implicate such endocrine involvements. Vitamin C, which seems to counteract malignancy, is a potent activator of the adrenal gland as well. Adrenal insufficiencies; e.g., vitiligo, are related to higher tumor incidence.

It has been known from cloning experimentation that the cell nuclei of the Leopard Frog (Kidney tumor tissue), or of the mouse teratocarcinoma, carry a normal genome and develop into normal tadpoles in sharp contrast to what has been commonly accepted and known, (McKinney et. al, 1969). Mintz and Illmensee (1975) were able to produce normal mice from mice with teratocarcinoma parents suggesting that the typical chromosomal aberrations in cancer cells must be of a superimposed or mediated falsification of genetic information which may otherwise be intact. Klemke (1977) has pointed out how the superimposed falsifications on the gene level may develop beginning with defined alternations on the level of mitochondrial membranes. Considerable biochemical knowledge is required to understand the Klemke conceptualization which in my view constitutes a dramatic forward step in modern cancer research.

Tumosterone, discovered by Klemke (1977) is apparently injected into the cancer cell by means of

cell bound immunity requiring the contact of the killer lymphocyte with the tumor cell. When injected into the cancer cell, the tumosterone is thought to go directly to the chromatin. More recently Matter (1979) has shown in the laboratories of Hoffman-La Roche at Basle that a water-insoluble substance injected by the killer lymphocytes goes across the cancer cell plasma membrane to the nuclein. This effect of the tumosterone may either result in a re-differentiation of the tumor cell genome or the deliberation of a gene-induced mechanism which may lead to the self-destruction of the tumor cell itself by the freeing of lysosomal enzymes.

DHEA

In addition to this, another steroid, DHEA (dehydroepiandrosterone) has been shown by *Arthur Schwartz* and cooperators to very effectively counteract malignant cell metabolism. It seems that this steroid is an important component of the body's anti-cancer surveillance system as well since it had been shown that women showing up with breast cancer have an abnormally low DHEA level in their blood. A low level of DHEA leads to lack of decisiveness and poor initiative as well as latent depression in the patient. These are among others typical psychostructural findings in cancer patients. Furthermore, the low DHEA level is correlated to a very low incidence of criminal potential, as we have shown. On the other hand, the psychiatrist of a German hospital which is exclusively reserved for the treatment of criminals feels that those patients show an abnormally low incidence of cancer. This, by the way, is also known from schizophrenics.

Since early 1982 we are most actively engaged in investigating the DHEA cancer relations, and the possible use of DHEA to better control cancer. DHEA is exhausted by the onset of the malignant disease itself. It is not augmented by the onset of the disease and, therefore, does not fit into the classical pattern of the immuno defense. DHEA may explain why malignant disease stays static in it's incidence despite increasing environmental challenges: cancer is more readily determined by the endogenous surveillance systems or their failure than so far thought. Our therapeutic attempts, therefore, have to follow this perception.

DHEA is also decreased by the stress of a surgical intervention, by psychic stress, by diuretics, and by the lack of vitamin C, vitamin E, zinc, magnesium, selenium, and cholesterol! We have found that a tripertenoid, squalene, seems to be an early substrate precursor of DHEA since it is helpful to increase the serum DHEA levels. In addition to this, squalene drastically increases the polarization of cell membranes thus apparently increasing the functioning of cell bound immunity. From the phylogenetical standpoint, squalene is a very "old" substance. In 1981 a broad public had been informed by the press that sharks almost never develop malignant cancers. One liter of shark liver oil contains 700 g! of squalene. It is worthwhile to mention that also the shark is phylogenetically very "old."

CESIUM, RUBIDIUM, AND GLUTATHIONE

The cancer cell is determined by showing an abnormally low pH level, the concentration of the H + ions in the plasma of cancer cells is potentially too high. The relatively low pH results in the activation of enzymes - e.g. of oncogenic phosphatases - which assure a higher malignant potential and aggressiveness of the cancer cell.

The concept to inactivate H + ions inside of the tumor cells is, therefore, an eloquent one.

It had been shown by the eminent American physicist, Keith Brewer, that cesium and rubidium are taken up by tumor cells and then lead to an increase of the tumor cell pH. These elements inactivate ionic hydrogen.

Indeed, the researchers *Messiha and El-Domeiri* in the Texas Tech University Medical School at Lubbock have shown, that cesium is most effective in the supression and regression of Sarcoma-I in mice.

We have in the meantime shown that cesium tetrachloride is effective in the management of most problematic tumors, e.g. of advanced bronchogenic carcinoma with bone metastization. Indeed, for this kind of cancer, cesium seems to be for the time being a treatment of choice.

The cesium therapy of cancer - and possibly the cancer prevention by cesium - is a very pragmatic but a very intelligent one. It is inexpensive and non-toxic over unlimited time.

Furthermore, it is worthwhile to mention that the application of pure urea and of the sulfurpeptide, glutathion for the treatment of cancer seems to have functional similarity to the cesium therapy.

PREDNISONE

The tumosterone effect may be somewhat imitated by the hormone prednisone. Prednisone, in contrast to other cortisones, has a certain similarity to tumosterone with respect to chemical structure and function. This apparent similarity is limited to prednisone and does not include the other cortisones which may explain the particiular value of prednisone in cancer treatment. In view of what has been said concerning tumosterone, it

would appear that immune capacity would demand the concentration of the tumosterone in the lymph cells themselves and that immune cell interaction alone would not do the job! This may indeed explain why until recently immunologists were somewhat reluctant to admit to the existence of an anti-tumor surveillance system of immunity. However, the fact that cancer exists in uncounted people in a dormant or in situ form, and that in other individuals it becomes slowly progressive; while in others, never develops at all indicates that the organism provides an endogeneously produced surveillance principle to suppress cancer genesis. We are witnessing the development of important evidence that tumosterone is such an agent!

IMPLICATIONS FOR ADRENAL FUNCTION

A possible futuristic tumosterone therapy of cancer might constitute the potentiation of the natural mechanism serving to protect us all. In connection with possible tumosterone effects, we made a very interesting clinical finding recently: a lady, age 40, with left breast removal three years earlier because of malignancy and free from any sign of malignancy, and being of an aggressive personality; with blood pressure 145/105 mm Hg, and remaining right breast being of abnormal size, was subjected to a major procedure of plastic surgery for left breast build-up and right breast reduction. Approximately eight weeks after the reparative surgery and five weeks after the cosmetic surgical procedures which all proved quite successful, the patient developed a very progressive bone metastization with sudden onset of multiple bone lesions and a spontaneous fracture of the right femur neck. Nevertheless, all parameters of cell bound immunity were as good as before and there was no change in the excellent BCG response. We did not administer any other therapy than prednisone (5-8 mg/d); ergocalciferol (an early tumosterone precursor); 3.0 grams of vitamin C, and calcium orotate (1 gram/day). Within a few weeks the lesions recalcified and the fractured femur healed for normal functioning which is most uncommon clinically.

It is my belief that the rather extensive intervention of plastic surgery produced an important challenge to the adrenal functioning of this patient and this resulted in decreased tumosterone levels and associated vulnerability. Tumosterone imitating therapy and time yielding a most amazing and lasting "cure" of a conventionally hopeless metastatic condition. This very uncommon and certainly dramatic clinical case teaches us that dormant cancer foci may be omnipresent even if the patient shows a state of complete health with nominal clinical parameters. The organism requires a constantly functioning mechanism of endogenous immune surveillance for the suppression of cancer potentials would appear to be a reasonable conclusion. Now, with the work of Klemke (1977) there is a growing body of evidence that tumosterone is a natural and anti-cancer surveillance mechanism: it is my opinion that in the future research will have to focus on the amplification of what nature provides us to suppress cancer and that a synthetic tumosterone would be a very desirable intervention; or, perhaps better yet, the providing of the natural raw materials or precursor substances to the organism to potentiate an adequate biodynamic synthesis of the endogenous tumosterone.

VITAMIN C

The administration of very high doses (10 grams/day) of vitamin C (Cameron and Pauling, 1979) may well work as a tumosterone booster due to its specific adrenal action. This may be more likely with the simultaneous adminstration of ergocalciferol and copper gluconate however. Some fifteen years ago in Germany high doses of ascorbate were frequently and successfully employed for the treatment of male impotence, where the required dose was some 10-15 grams/day and where the effect of therapy appeared some one to two weeks later. This observation suggests that adrenal cortex stimulation, or steroid metabolism boosting, is a likely mechanism or path of action of the high ascorbic treatment. This is further true for the anti-fatique and anti-rheumatoid effects of high ascorbate which Norman Cousins (1979) describes in his brilliant book entitled "Anatomy of an Illness".

In our work we have found that aberrations in the mineral household of the cancer patient (Nieper, 1980) are not due to the presence of the tumor, but must be related to the host biodynamics as challenged by the cancer process. In the case of immunological, non-recognition of the cancer (e.g., in patients having blood Type A) the trace mineral ecology in whole blood analysis remains perfectly normal despite the tumor growth. If the Zn/Cu ratio increases to normal or near-normal proportions, the cancer undergoes regression more or less spontaneously and remains remitted and can subsequently be rather successfully treated (Nieper, 1980). We have several important lines of evidence that point to steroid metabolism of the adrenal glands as responsible for the proper whole blood trace mineral pattern as well as the disturbed Zn/Cu ratios and by this means and in some fashion tumosterone formation may also be involved. Finally, we have recently observed that daily doses of

more than 10 grams/day of ascorbate drastically increases the Zn/Cu ratios in whole blood which may also point to an adrenal connection. Remarkably enough, ergocalciferol, at about 300,000 units/day, results in the same effect.

As I have previously written in the *JOURNAL*, I have tried to work with the organism's biodynamics and its natural anti-cancer immune pathways in a fashion I have called *Eumetabolic Therapy*, which Linus Pauling calls *Orthomolecular Medicine*, and others, like the Editor-in-Chief of this *JOURNAL*, call *Biological Medicine*. I believe the material discussed in this paper illustrates this basic approach.

With the high ascorbate treatment we are for the first time in a position of putting pressure on the natural functioning of an anti-cancer immunodefense endogenous to the organism. Recent controlled studies with the Nieper-Regimen (1980) and incorporating benzaldehyde with the Cameron-Pauling high ascorbate program we are producing in our clinic at Hannover, West Germany, quasi-cures of lung and bronchiogenic cancers; these are inoperable and out-treated by orthodox standards. We are observing quasi-cure of a metastasizing breast cancer with extensive liver metastization; most successful remissions of excessive chronic myeloid and lymphoid leucemias; most surprising remissions of Grade IV "out-treated" Hodgkin cases (in combination with constant application of gamma-globulin), and quasi-cures of three colon malignancies with liver metastization.

I find it always a highlight in my professional career to learn from the patient and to learn from nature. However, I am also a proponent of a thorough education of the patient and his family so that psychological bases are touched as well. Obviously, orthodox chemotherapy, surgery, and radiation alone are irrational interventions reflecting a historical preoccupation with the invasiveness of disease at the expense of host resistance and host susceptibility issues that keynote "tomorrow's medicine" today. The progressive health care of tomorrow I have called Eumetabolic Medicine from my European perspective and urge that eumetabolic principles become the basic topic for cancer therapy education so as to deliver us from a symptom oriented, sickness care approach that has been a failing approach for decades.

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