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High Dose Vitamin C and Low Dose Chemo Treatment

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Summary

Research has shown that intravenous high dose vitamin C in cancer therapy cannot be dismissed but that it warrants further investigation. Recent studies have made more inroads into the understanding of the role of vitamin C, bolstering more the use of the therapy by practitioners in complementary and alternative medicine. The efficaciousness of a new high dose vitamin C and low-dose chemo therapy (HiCLoChemo) reported here indicates a quantum leap in cancer treatment, which borders on the miraculous. The results of the preliminary trial on 20 patients suffering from end stage metastatic cancers, including those of the liver, lung, breast, pancreas, uterus, brain glioma, and prostate, show a remission of cancer, some complete, as confirmed by the PET/CT images before and after the treatment protocol.

The components of the treatment are not new and their variational combinations have also been used before. The key difference lies in the application of the HiCLoChemo protocol, where the vitamin C infused first, facilitates the delivery of the chemo drugs at the microenvironment of the tumor. The paper discusses the vital role of vitamin C and factors that lead to the inducement of the immune system being recruited to join in the cancer battle.

The aim is to enlist cancer researchers, oncologists and cancer treatment centers to undertake clinical trials of the HiCLoChemo protocol. With confirmation of the findings, the treatment will represent a game-changer as it offers a treatment for terminal cancers that promises cancer remission at affordable cost, which is sorely needed.

Background Information

Cancer treatment is as painful as the diagnosis of the disease because of its side effects. Worse still, the side effects of aggressive chemotherapy often produce severe collateral damage that compromises the function of the body's organs, which can outweigh the benefits of treatment. That makes advanced metastatic cancer at some point an incurable disease with its care relegated to that of palliation with no expectation of recovery.

Dr. Robert Luk, a physician practicing in Johore Bahru, Malaysia, had been using high dose Intravenous Vitamin C regime (IVC) as an alternative procedure to treat terminally ill patients who could not afford the high cost of conventional cancer treatments. He was thinking only providing supportive care to give comfort and to improve the quality of life.

Surmising that supplementing the IVC with generic chemo drugs in low dosages would help, he ended up applying a combination of three chemo drugs used for the cancer type. The modified IVC treatment brought very noticeable improvements. Not only did the patients regain some normalcy of life, but they showed signs of cancer remission.

He happened to mention the results to Dr. Raymond Ngeh who provides PET/CT scan services to cancer patients a floor above in the same office building. With Dr. Ngeh offering to do PET/CT scan of the treatment progress on the cancer patients for free, the joint effort began in the fine-tuning of the formula and treatment protocol. They started to document the trials in early 2017 on patients with advanced metastatic cancer no longer responding to treatments, but still as a supportive care because of regulatory concerns. Over the course of six months, they were able to treat 20 new patients who came on their own through recommendation or by word of mouth.

The response to the treatment is positive in all cases. The preliminary findings and PET/CT images of 11 of the patients, which are representative of all the 20 cases, are documented with clinical notes in the report attached as Appendix A. The PET/CT images confirm a regression of cancer activities, namely, shrinkage of tumor in varying degrees—the cancers have either gone into remission or are in remission.

The results in the improvement of the quality of life are evident from the recovery of the basic normal functions after a few treatments. The camaraderie shared by the patients was quite palpable and uplifting, rather than the usual gloom in the air of patients' room, which the author witnessed. A most dramatic change in life was that of patient 2, suffering from advanced hepatocellular carcinoma, who was given just a few weeks to live. Wheeled in with pain and hanging on with life support, she regained her mobility functions and color of health after 4 treatments, and her cancer is now in remission.

The HiCLoChemo Formula

The HiCLoChemo formula protocol is not a state of the art treatment. Each treatment component is a modification of remedies already in use. It consists of a high dose of IVC, namely, an intravenous dose of 1.5 gm per kg of body weight of vitamin C, which is already commonly dispensed by complementary and integrative cancer therapists.

The second component is an infusion of a cocktail of three generic chemo drugs, right after the IV ascorbic acid. Each of the chemo drug is of lower dosage at a third the standard strength.

Various combinations of IV ascorbic acid and chemo drugs have also been used before but the results have been inconclusive. The key difference in the new HiCLoChemo protocol lies in the sequential order of administration, infusing the vitamin C first, then followed by the cocktail of chemo drugs. This allows the vitamin C to set the stage of the microenvironment that tips the balance against cancer and renders it conducive to recruit the immune system in the cancer war.

The details of protocol and formula are documented in Appendix B.

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The micro-ecology of cancer

Cancer cells have the same composition as other host cells, except that they have undergone mutations, as well as other epigenetic changes. Cancer cells are usually not detected by the immune system. But unlike normal cells that are highly regulated to form tissues of organs, cancer cells grow with no functional role except to feed and survive in the micro-ecology. With far less genetic regulations, cancer cells proliferate unchecked without structural form or functional burden into tumor masses that squeeze into the limited micro-real estate and to metastasize to other tissues, leading to the dysfunction of the organs they reside in.

Transcriptions from mutated genes make aberrant cells but not necessarily cancer cells. Cancer cells come from several gene mutations and the mutations must be present in chromosomal pairs (the two-hit hypothesis). The upshot of the mutated genes coopted by evolutionary selectiveness in the micro-ecology into becoming oncogenes, is that cancer cells live longer (replicate more times passing on the mutations), grow faster (higher rate of mitosis), and extend more blood vessels to feed and sustain the tumor mass growth better (angiogenesis), and then spread to other parts of the body (metastasis).

In short, cancer cells are born resilient to survive in the micro-ecology against an elaborate immune system that protects the body by detecting and destroying pathogens and diseased cells. Also, cancer cells are not pathogenic by themselves until they become malignant. Furthermore, cancer cells have protein covers and signaling mechanisms that hide their antigenic cancer face to evade detection by the immune system. Even as the cancer masses grow uncontrollably and metastasize, the immune system still cannot perceive the life threatening danger of the tumor. Even with pain and cachexia syndrome setting in, cancer's insidious role remains hidden, frustrating the immune system's mission to protect the body. This defensive guile is a hallmark of cancer and the presence of the cancer disease is self evident of its survival tenacity in the micro-ecology.

When cancer is diagnosed, it still holds an innate advantage in resisting treatments. The cancer cells reside right alongside normal cells. Because the chemo drugs in cancer therapies are usually not delivered directly to the cancer cells, they are administered in high dosages to be effective. But the cytotoxicity of the drugs does not distinguish between normal and cancer cells, and inflicts damage to both. As a consequence, the collateral damage to the host tissues can be as severe as the symptom of the disease. Thus, once cancer metastasizes in an advanced stage, it becomes almost incurable and the body is caught in a death trap where the side effects of the therapy often outweigh its benefits.

The many failed cancer therapies are a testimony that cancer is indeed a most resilient and formidable foe. The new HiCLoChemo treatment has found cancer's Achilles heel, in its defense structure and mechanism. The following sections discuss the strategic deployment of HiCLoChemo's arsenal that destroys the cancer cells and undercuts their defensive guile and the inducement of the immune system to join in the cancer battle.

The role of high dose IV vitamin C

Ascorbic acid or vitamin C is a treatment staple of complementary and integrative practitioners for a range of diseases, and high dose IVC is widely used in complementary and integrative cancer therapies but the results are inconclusive [1]. Its therapy in cancer treatment was controversial and derided as having no merits by the Mayo Clinic studies in 1978 [2]. However, reviews of subsequent research show that vitamin C cannot be dismissed as having no anticancer effects or benefits, and that vitamin C therapy warrants further investigation [3]. In the meanwhile, vitamin C continues to be used as a supplement by many patients because of its observed effectiveness in relieving pain, as well as boosting the effects of chemotherapy.

Studies have now established that the intravenous dose of 1.5 gm per kg of body weight of vitamin C, commonly used as a high dose, is safe for cancer therapy with no side effects [4]. A recent paper has shed more light on the biochemistry of the analgesic properties of high dose vitamin C in relieving cancer pain for palliative support [5]. More cogently, another recent publication confirms that a high-dose ascorbic acid does kill cancer cells. Hydrogen peroxide released in the decomposition of vitamin C is toxic to cancer cells. Vitamin C is not toxic to normal cells because of the presence of catalase, which catalyzes the oxidation of hydrogen peroxide into water and oxygen. Cancer cells are susceptible because of their low levels of this enzyme. This finding is aptly captured in the caption "Low levels of catalase enzyme make cancer cells vulnerable to high-dose ascorbate" of the news bulletin (Jan 2017) of the Carver College of Medicine, University of Iowa, on the publication of its research paper [6]. The work was extended to include soft tissue sarcoma [7]. The IVC efficaciousness had also been found previously by the research work done at the University of Kansas Medical Center, reported in a paper coauthored by Dr. Jeanne Drisko, which showed that high dose intravenous vitamin C killed ovarian cancer cells while leaving normal cells unharmed [8].

In the perfusion of blood, water-soluble vitamin C in high concentrations in the plasma penetrates more deeply into the microenvironment of the cancer sites than that of the normal cells because the tumor tissues have less structural form. Also, vitamin C, being a nutritional supplement, is ingested more by the faster growing and dividing cancer cells. Once in the microenvironment, the hydrogen peroxide liberated in the breakdown of vitamin C, "drops" at strategic proximity to kill the cancer cells [9]. This surprise attack, deployed via the high dose IVC forms the first line of attack in the cancer battle, which affects the epigenetic landscape of the cancer cells.

The second line of attack by the cocktail of chemo drugs

Following the intravenous ascorbic acid, the cocktail of three chemo drugs, infused right after, follows in the same passageway of the plasma set by the water-soluble vitamin C to the tumor sites with ease. Once at the microenvironment of the cancer tissue, the chemo drugs commence attacking the cancer cells, which are being weakened by the onslaught of the hydrogen peroxide. Although in lower dosages, the combined actions of the chemo drugs in this second wave of attack, turn out to be of sufficient lethality. Each chemo drug kills cancer cells by its own cytotoxic design. Therefore the use of three distinct chemo drugs in addition to IVC proves more deadly in destroying the cancer cells.

In other words, the synergy of the combined chemo attacks more than compensates for the lower dosages of the drugs. Crucially, the

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side effects are reduced significantly and the analgesic properties of vitamin C are expressed more effectively as a result of the lower dosages. Therefore, the treatment will have no consequential side effects.

The ascorbic acid also helps as an epigenetic agent to deliver the chemo drugs at close proximity in the microenvironment of the tumor cells, thus packing more cytotoxic punch in the cancer assault. This is a direct consequence of the sequential administration of high-dose IVC first, followed by the chemo drugs, which marks the distinction of the protocol reported here.

The two fronts of assault—the sneak attack of hydrogen peroxide and the multi-cytotoxic battering by the combined chemo drugs—will take a heavy toll on the cancel cells, but they may not be sufficient to win the cancer battle.

Inducing the immune system to join in the cancer battle

There is a third factor in the cancer-battle equation—that of the immune system. However, the problem is that the immune system has failed to protect the body as evident by the mere fact that the cancer disease has progressed so far.

The immune cells are not sitting by idly, but are ever-alert on the look-out for pathogens and diseased cells, including cancer cells, to destroy them. However, the cancer cells are just better in evading detection by the immune system. Furthermore, cancer cells can express tumor-specific proteins on their cell surface to suppress the activation of the immune system [10]. It is as though cancer cells undergo face changes magically like Sichuan opera artists [11].

Thus, even though cancer cells may express many tell-tale proteins on their surface, they usually evade detection by the immune system. The loud symptoms of the body in pain, suffering from cachexia syndrome and organ dysfunctions, are not detectable by the immune system. The communication between the cells is carried via signals by molecules, such as cytokines, which does not convey maladies at the macro level. And unfortunately, there are no mechanisms in the immune system to verify the genetic birth print of the deviant cells.

Nevertheless, the immune system's army of killer agents, the natural killer cells, phagocytes, big-eater macrophages, and the killer T-cells, is always there ever-ready for action, except that it is not harnessed in the battle against cancer. That is to say the immune system has a critical role to play to break the cancer disease. The issue is bypassed in conventional cancer therapies by surgery, radiation and chemotherapy. The chemo drug is administered at the highest possible dose, just short of causing irrecoverable harm to the patient. Rather than enlisting its help, the severe collateral damage inflicted by conventional therapies end up harming the immune system.

The dual assaults initiated by the HiCLoChemo therapy may not be sufficient to win the cancer battle without the help of the immune system. The hypothesis is that the immune system is drawn into the cancer battle by the following mechanism: the massive death of cancer cells brought about by the HiCLoChemo treatment recruits other accessory cells to the cancer sites. These accessory cells (macrophages, dendritic cells and phagocytes) can then process the dying or death cancer cells in such a manner as to reveal tumor-specific proteins to cytotoxic T-cells. Once these cytotoxic T-cells are activated, they can be produced in large numbers to directly kill the remaining cancer cells that survive the HiCLoChemo treatments.

Summoned thus to battle, the elite forces of natural killer cells and killer T-cells of the immune system form the third line of attack, charging through the battle lines like fresh cavalries to cut down the enemy forces already in disarray. The tumor succumbs under the combined attacks of the three forces, as is evident from the PET/CT images of the massive death of cancer cells. Crucially, the side effects are reduced to inconsequential throughout the cancer battle due to the lower cytotoxicity factor and the analgesic effects of vitamin C.

The induced awakening of the anti-cancer factors of the immune system is, interestingly, the oldest form of cancer therapy, first deployed by Dr. William B. Coley in the 1890s. Dr. Coley injected Streptococcal bacteria in a terminally ill patient suffering from advanced sarcoma. The bacteria triggered an intense immune response that killed both the bacteria and the cancer cells. The cancer went into remission and the patient, expected to die in a few weeks, went on to live for eight more years [12].

Dr. Coley's discovery is the inspiration behind cancer immunotherapy [13]. With the discovery by Dr. James P. Allison in 1990s of the checkpoint inhibitor CTLA-4 [14], a protein that regulates the killing activities of T-cells, the role of the immune system in cancer therapy is revitalized. Dr. Allison describes the drug ipilimumab developed by his lab as releasing the "brakes" on the immune system designed to safeguard T-cells' overactivity. By blocking the checkpoint inhibitor, the drug unleashes the T-cells to kill the tumor cells. This has led to a resurgence of research in immunotherapy, which has now become a pillar of cancer therapy [15].

However, HiCLoChemo's deployment of immune agents in the cancer battle is not the same as that in cancer immunotherapy. While in immunotherapy, the immune system is selectively reinforced by tinkering, such as by adding new synthetic monoclonal antibodies or chimeric antigen receptors, HiCLoChemo goes straight for the throat of cancer's defense mechanisms to expose its tumor face, thus inducing the recruitment of the immune system.

Concluding Remarks

If anything cancer therapies have proven, it is that cancer is a wily foe. Cancer cells are not foreign terrorists, but homegrown and fit right in among the tissues of normal cells. Cancer cannot be fought through the sheer might of cytotoxic drugs alone—the more cytotoxic power is unleashed, the greater the damage to the host's organs and the immune system (as well).

The HiCLoChemo therapy fights the cancer battle with strategy, which relies on two key factors. The first factor is the sequential order of administration, the infusion of IVC first followed by the cocktail of chemo drugs. The treatment rides on the effectiveness of the one two punch of hydrogen peroxide and chemo drugs to inflict severe damages on the tumor. The second factor is the balance of cytotoxicity of the therapy, which is lethal enough to disable the tumor's defense mechanisms without compromising the immune responses. The second factor thus unleashes the full forces of the immune system to detect, kill and mop up the cancer cells—in a reenactment of the first recorded cancer war that engaged the immune forces, induced by

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Coley's Streptococcal bacteria infecting the cancer cells. The PET/CT images of the remission of cancer confirm that HiCLoChemo delivers on these two key factors in the cancer battle.

Supplementary Information

For more Information please follow Appendix A & B.

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