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High Dose Intravenous Vitamin C for Secondary Cancer Prevention

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ABSTRACT

Despite a very high rate of recurrence, secondary prevention after treatment for cancer is almost nonexistent. Radiation and chemotherapy are both time-limited due to toxicity. Hormone therapy for breast cancer has quality of life compromising side effects, and limitations on duration of use. What is needed is a treatment intervention that is non-toxic, sustainable, and affordable. Such a treatment would need to be long term since the lag time for relapse can extend beyond 10 years. The treatment would need to have research-based evidence of potential benefit, since invariably such an intervention will be applied based on theory since the type of study required to prove efficacy is impossible to do in a standard placebo-controlled manner. High dose intravenous vitamin C fulfills all these criteria. There is sufficient evidence regarding its mechanism of action, safety, and affordability to justify actively offering this option to patients. This paper describes the rationale for such an approach and encourages this form of treatment to be made available to all patients who have had cancer.

Keywords: High dose vitamin C, cancer prevention, intravenous vitamin C, complimentary cancer treatment, cancer relapse, breast cancer, ascorbate.

Discussion

For most forms of cancer there is a common pattern that is followed. A diagnosis is made, and a treatment plan is crafted. Frequently those treatments include surgery, radiation, and/or chemotherapy. Treatment is over a defined period after which the patient is discharged with a plan for intermittent monitoring for relapse. What comes next can be excruciating. A waiting game hoping that with each new blood test or new image there will be no evidence of recurrence.

Five-year "cancer free" is not cancer free

The five-year disease-free interval is a useful tool for quantifying the effect of various therapies but does not fully reflect the state of the cancer. Cancer is a cellular disease. An individual who is tumor free at the five-year mark could well be harboring billions of cancer cells that are still in the process of dividing [1]. Every cancer has a doubling time. The doubling time varies depending on the cancer and its stage as well as its cell site. Breast cancer has been estimated have a doubling time between 90 and 200 days [2]. Colon and lung cancer have equally long doubling times. Adenocarcinoma of the lung has been estimated to have a doubling time of 72 days. At that rate of doubling a person diagnosed with a 1 cm nodule at age 55 would likely have had that cancer start at age 43 [3].

Achieving the five-year post treatment milestone without tumors is worth celebrating, but it can also impart false confidence. Cancer cells can still be doubling on a consistent basis. Evidence of this comes from studies looking at "distant metastases." Those are cancer recurrences that occur beyond five years. An article published in the New England Journal of Medicine evaluated the 20 year risk of breast cancer recurrence. Among patients with stage T-I disease the risk of recurrence was 13% with no node involvement, and 20% if 1-3 nodes were involved. The risk increased to 34% if there were more than three nodes involved [4].

A study of men with a history of colon cancer published

in the International Journal of Cancer showed a 1 in 12 chance of having the cancer reappear between years five and 10 despite being tumor free at 5 years [5].

Most cancer treatments are carcinogenic

In addition to late relapse, there is an increased risk of secondary cancers in people who have ever had a malignancy. Some of this risk may emanate from the factors that contributed to the original cancer. Exposure to toxins and lifestyle risks frequently persist. However, there is also evidence that radiation treatment increases the risk of leukemia, myelodysplastic syndromes, and solid tumors. Many chemotherapy drugs increase the risk for leukemias [6].

The challenge of stem cells

Even after tumors have been fully wiped out, and the patient achieves the desired status of "no evidence of disease" (NED) stem cells can still be active. These cells are felt to be resilient to chemotherapy and other treatments. They can become a source of cancer cell reproduction leading to relapse [7].

The potential of high dose intravenous vitamin C (IVC)

Vitamin C has been studied for decades both in the lab, and in clinical settings. There are dozens of studies demonstrating the toxic effect of vitamin C on various cancer lines in vitro. The mechanism of action is felt to be from vitamin C producing high levels of hydrogen peroxide [8]. This free radical is destructive toward cancer cells, but easily neutralized by natural cells. Clinical safety of IVC has been well-established both through studies, and through decades of patient treatment [9]. There are small studies and innumerable case reports of positive outcomes however there is no absolute proof that adding vitamin C to conventional treatment can help delay progression of cancer [10]. Nevertheless, many patients seek vitamin C therapy after conventional treatments have failed, or the cancer is far advanced. It is conceivable that IVC would be much more efficacious in the early, cellular stages of disease before tumors have developed. It is theorized that when infused intravenously vitamin C has the potential to destroy cancer cells in their formative state when they are at the most vulnerable, cellular level. This occurs before the patient is aware that cancer is present.

Because IVC is safe for natural cells, this treatment can be applied, and may be most advantageous when there is no evidence of cancer present. If cancer cells are dividing and going through their doubling process, a 'title wave' of high dose vitamin C could reduce the total number of cells thus not allowing them to progress to the tumor stage of disease. The analogy would be a bit like cutting back vines, so they don't choke the forest. The forest can live with the vines as long as they do not overwhelm the trees. Since the doubling time for most cancers extends beyond 30 days, a rational interval of treatment is monthly. The goal is to periodically reduce the total volume of cancer cells in circulation. Another factor to consider with any secondary prevention recommendation is cost. Intravenous vitamin C ranges between $200 and $300 per infusion. This puts it at an affordable price range for a large segment of the population. Many patients spend this much on oral supplements trying to bolster their health after cancer. It is likely these funds would be better directed toward intravenous vitamin C.

Ease of access is also important. Any doctor, or nurse practitioner has the capability to deliver high dose vitamin C in their office without any expensive equipment or infrastructure changes. At our center we have been using this approach for secondary prevention for the past seven years. Although our volume is too small to draw conclusions, we have been encouraged by the results. With sufficient funding, an organized network could be established to develop a population cohort of individuals receiving this therapy. They could be tracked over years so that results could be quantified. Given the magnitude of the problem that we face, and the potential for benefit, as well as its ease of implementation, such an initiative seems worth pursuing.

Conclusion

One of the greatest risk factors for getting cancer is ever having had it in the past. The contributing factors are the persistence of stem cells, incompletely eradicated primary cancer cells, the carcinogenic nature of many cancer treatments, and the variables both environmental and genetic that predisposed the patient toward acquiring cancer in the first place. Secondary prevention for cancer is nearly nonexistent in any organized and broadly recommended manner. Based upon its safety, abundant research-based evidence of toxicity toward cancer cells, and preliminary clinical findings as well as ease of administration and modest cost, this paper advocates for the use of monthly infusions of high dose vitamin C for patients who have ever had cancer. Since it is theorized that the cancer is most vulnerable when in a cellular state, such therapy should be continued indefinitely to prevent the cells from forming tumors. It is reasonable to offer this option to patients with proper informed consent regarding the lack of absolute proof. The type of evidence ultimately required can only be achieved by implementing this treatment and then tracking its outcome.

Disclosures

References:

1. Friberg S, Mattson S (1997) On the Growth Rates of Human Malignant Tumors: Implications for Medical Decision Making. Journal of Surgical Oncology 65: 284–297.
2. Fornvik D, Lang K, Anderson I (2016) Estimates of Breast Cancer Growth Rate from Mammograms and its relation to tumour Characteristics. Radiat Prot Dosimetry 169(1-4): 151-157.
3. Harris K, Khachaturova I, Azab B (2012) small cell Lung cancer Doubling Time and its effect on clinical presentation: A concise Review. Clinical Medicine Insights: Oncology 6: 199–203.
4. Pan H, Gray R, Braybrooke J (2017) 20-Year Risks of Breast-Cancer Recurrence after Stopping Endocrine Therapy at 5 Years. N Engl J Med 377: 1836-1846
5. Bouvier AM, Launoy G, Bovier V (2015) Incidence and patterns of late recurrences in colon cancer patients. Int J Cancer 137: 2133–2138.
6. The American Cancer Society medical and editorial content team. Second Cancers Related to Treatment. https://www.cancer.org/treatment/survivorship-during-and-after-treatment/long-term-health-concerns/second-cancers-in-adults/treatment-risks.html
7. Chang J (2016) Cancer stem cells; Role in tumor growth, recurrence, metastasis, and treatment resistance. Medicine 95: S1(e4766).
8. Verrax J, Calderon P (2009) Pharmacologic concentrations of ascorbate are achieved by parenteral administration and exhibit antitumoral effects. Free Radical Biology & Medicine 47: 32–40.
9. Hoffer JL, Robitaille L, Zakarian R (2022) High-Dose Intravenous Vitamin C Combined with Cytotoxic Chemotherapy in Patients with Advanced Cancer: A Phase I-II Clinical Trial. PLoS ONE 10(4): e0120228.
10. Nauman G, Gray JC, Parkinson R (2018) Systematic Review of Intravenous Ascorbate in Cancer Clinical Trials. Antioxidants 7: 89.