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Riordan Clinic

Health Hunters Newsletter

A service of Riordan Clinic, cofounded in 1975 by Olive W. Garvey and Hugh D. Riordan. The Riordan Clinic is a not-for-profit 501(c)(3) corporation. Go to www.riordanclinic.org to make your tax deductible donation today or visit us at 3100 N. Hillside, Wichita, KS 67219.

Inside This Issue

Riordan Clinic is a not-for-profit 501(c)(3), nutrition-based health facility in Wichita, Kansas. We have integrated lifestyle and nutrition to help you find the underlying causes of your illness. Since our inception in 1975, the mission has been clear and unwavering to "…stimulate an epidemic of health."

Vitamin C and Cancer

THE AUTHORS

Jennifer Mead, ND
and William Wassell, MD

The Riordan Clinic is probably most famous for Dr. Riordan's interest in furthering research on Linus Pauling's original hypotheses that Vitamin C could be a potential cure for heart disease, chronic infections and even cancer. His hypothesis was first developed some time in the 1950s and nearly 70 years later, it is still alive and well. Researchers all over the world, including several prestigious universities here in the states (John Hopkins, UNC Chapel Hill) are still very intrigued by Vitamin C and the promising results shown in vitro and animal studies. Case reports are coming in from all over the world of how IVC is curing many diseases considered by mainstream medicine to be incurable. Over 2 decades have passed since Linus Pauling's death in 1994 and with each decade the attention on Vitamin C has exponentially increased. This fact alone could be evidence of the importance of Vitamin C in and of itself as Max Planck has said, "A scientific truth does not triumph by convincing its opponents and making them see the light, but rather because its opponents eventually die and a new generation grows up that is familiar with it." If he is correct then by 2050 Vitamin C will have on its own merits, proved its worth to the public, and will quietly be accepted by corporate medicine.

70 years of research on Vitamin C show it to be much more than the "anti-scurvy factor". It is the master controller of electron distribution and flow in our bodies. It is needed in over 10,000 biochemical reactions. It is a major antioxidant in the body, the immune system is practically useless without it, and the list goes on and on. The truth is that Vitamin C is causing a **paradigm shift** in science and medicine in the way it views the cause of disease and inflammation in the body. When any agent produces oxidative stress in a tissue, inflammation will result if insufficient antioxidants are not present to keep the tissues re-dox potential balanced. We should point out that it was not too many years before the discovery of Vitamin C that Linus

Vitamin C and Cancer continues on page 2...

Contact the Editor

Please send any comments or suggestions to newseditor@riordanclinic.org.

Thank you for reading,

Erin Fagan
Editor

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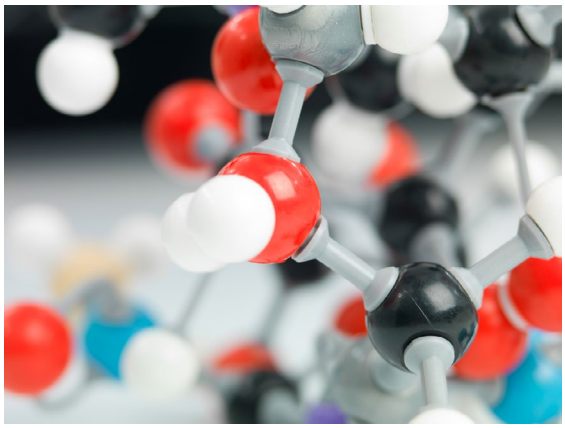
Vitamin C and Cancer continued from page 1...

Pauling had been awarded the Nobel Prize in Chemistry for discovering the nature of the chemical bond. It is this sharing of electrons between two different atoms in a covalent bond that plays such an important place in health. You have to think on the biochemical level now because that is where all war is waged in the human body—the enemy is oxidation and the defense is reduction. This war begins at conception and ends at death with oxidation always being the winner. We are in good health when this oxidation/reduction is kept in balance. Knowing this, we should see how important Vitamin C is since it is the body's major antioxidant.



The most important thing to know about Vitamin C is that it is produced from glucose (sugar) in the liver by all animals except for humans, a few of the large erect primates, a fruit eating bat, the guinea pig, and a few primitive birds. For these exceptions, diet is their only source of Vitamin C, and it only becomes a problem when the food source lacks adequate Vitamin C. Cancer cells derive energy by fermenting glucose. Glucose and Vitamin C (being nearly identical molecules in size and shape) use the same ports to enter a cell. Cancer cells need more glucose than normal cells to get the same amount of energy because they only have fermentation as a metabolic process which is inefficient producing only about 10% of the energy; the same amount of glucose would run through Krebs Cycle utilizing oxygen. This increased utilization of glucose produces heat and can be detected and displayed by the infrared cameras. Mainstream medicine however chose to use a much more expensive and profitable way to view this activity by attaching a radioactive element to glucose and then looking for hot spots with a gamma camera. The radiation is called a gamma ray but is identical to an x-ray of the same energy level. A gamma camera is used to find areas of increased activity which is what cancer shows. The same information can be obtained with less expense and no radiation exposure by giving normal glucose and then scanning the body with an Infrared camera.

So, what does that have to do with Vitamin C being used as a therapeutic agent?

As stated, cancer can only use glucose (sugar) for fuel and because Vitamin C is nearly identical to glucose; cancer soaks up Vitamin C as quickly as it does glucose. Cancer can metabolize the glucose for energy, but cancer cannot metabolize high amounts of Vitamin C properly. Cancer and many infections are found to have unusually high concentrations of iron and other metals. The interaction of the Vitamin C and the metals is where the therapeutic response begins. Much of this iron in cancer cells is in the +3 oxidation state and when reduced to +2 state by Vitamin C donating an electron a reaction is triggered that results in production of hydrogen peroxide and other reactive oxygen species. In high concentrations, the hydrogen peroxide will damage the DNA and mitochondria by raising free radicals and also inactivates an enzyme needed to metabolize glucose, therefore depriving the cancer cells of energy and creating cell lysis or cell death. Vitamin C also accomplishes a few other tasks:

Vitamin C and Cancer continues on page 3...

Vitamin C and Cancer continued from page 2...

helps increase collagen to help wall off tumors, inhibits hyaluronidase (an enzyme tumors use to metastasize), and can help induce apoptosis or programmed cell death, a metabolic process that is lost with cancer. It's unfortunate, but the gene that triggers cell suicide "apoptosis" does not work with cancer cells because the large amounts of oxidants required to destroy the cell depends on the cell being able to generate large amounts of ATP (energy) which it cannot do with cytoplasmic fermentation (sugar breakdown without oxygen) alone. The good news is that no matter how high the concentration, Vitamin C does not harm healthy cells.

The key phrase just mentioned twice is "High Concentrations". You have to get the blood level of Vitamin C high enough; which can only be done via Intravenous injection or injections directly into the cell. Our bodies tightly control intestinal absorption, so oral Vitamin C use will not create this "pro-oxidant" effect on cancer. All of the studies that have completely debunked Linus Pauling's theory were utilizing oral Vitamin C (what a waste of time and money!). As an example: If you take 25 grams of Vitamin C in one day, assuming your intestines can handle that much, you may get your blood level to six mg/dl. In order to create cell lysis of cancer, research has shown the blood level needs to reach between 350–450 mg/dl; nearly 65 times as high as can be reached orally! This is why in the beginning when we are trying to find a patient's IVC dose we run a blood level after the IV to make sure it reaches between 350–450 mg/dl. Once we get the results of these post IV Vitamin C levels we decide on the proper dose and frequency.

Can Vitamin C be performed in conjunction with chemotherapy and radiation?
At the proper dosage, Vitamin C will not negatively affect the work your oncologist is trying to perform with chemotherapeutics and radiation. In actuality, there are many studies now that have shown IV Vitamin C can help enhance the oxidant effects of chemotherapy by helping drive the chemo into the cancer cells more effectively. Studies have shown that Vitamin C IVs can also decrease pain from cancer, help patients better tolerate the side effects of chemotherapy and radiation, and help decrease the toxicity of conventional cancer therapies.
Most cancer treatments have many side effects, but you say Vitamin C has none? IV Vitamin C has virtually no major side effects. We do however have to watch kidney function closely as one must be able to filter fluids properly and those in congestive heart failure and others retaining fluids are monitored more closely, sometimes, but not often, patients may be instructed to avoid the therapy all together. The main side effects include all of those which can occur with any IV therapy, such as irritation at the injection site, etc. Sometimes patients will feel sensations in the areas of the tumors and occasionally experience reactions of detoxification such as dermatitis. The

Vitamin C and Cancer continues on page 4...

Vitamin C

THE AUTHOR

Annette Chlumsky, RN

Does nutritional therapy reduce the effectiveness of chemotherapy or radiation treatments? That question looms large over our patients that come to Riordan Clinic. Patrick Quillan, author of, "Beating Cancer with Nutrition" recognizes this debate and says cancer patients often feel like a child in a wicked divorce custody battle. The oncologist tells the patient, "Oh, no, don't take any vitamins because it will decrease the effectiveness of treatment." The nutritionist may tell the patient, "Don't take that poisonous chemotherapy/radiation," or the patient may have those feelings themselves and are torn as to what direction they want to go. In a perfect world, the oncologist and the nutritionist would work together to help the patient, and the patient would greatly benefit from their collaboration.

Several research reviews show nutrition may help, but never hinder, chemotherapy and radiation treatments. This is best summarized by saying antioxidant nutrients are best absorbed by aerobic (healthy) cells and poorly absorbed by anaerobic (sick, cancerous) cells. Antioxidants protect healthy cells, but not cancerous cells from prooxidative therapies, such as chemotherapy and radiation. If the healthy cells are protected, then the chemotherapy and radiation therapy can be more of a selective toxin against the cancer cells and not a general toxin to the patient.

A study cited in the Journal of Clinical Oncology provides evidence that the glutathione helps prevent Cisplatin (chemotherapy drug) induced neuropathy and it does not reduce the effectiveness of the chemotherapy drug. In another study, Vitamin E also was shown to reduce neurotoxicity from Cisplatin and protect the heart from damage while taking Adriamycin.

Vitamin C continues on page 5...

Vitamin C and Cancer from page 3...

IV Vitamin C is very hyperosmotic so at high doses most people experience what we call an "alarming thirst" which resolves as soon as the IV finishes. And since Vitamin C looks like sugar, it can cause an insulin rush and blood sugar to be brought into cells, a bit of low blood sugar may be experienced—hunger and mild light-headedness could occur, however, coming well fed and having food on hand will prevent this occurrence. We have to warn diabetics that the Vitamin C will interfere with their glucometer reading as the glucometer cannot even tell the difference between the sugar and Vitamin C; so caution has to be used with insulin dosing. We also warn patients never to have blood drawn within 24 hours of an IV, as it can produce false results.

Sounds too good to be true… are there any drawbacks? First, remember that at any given time only 1/3 of cancer cells are metabolically active; therefore the ones that are inactive will not absorb the Vitamin C and the same goes for chemotherapy and radiation. This is why there are always series of treatments, in order to hopefully catch all the cells in their metabolically active phase. Therefore, one drawback is that patients will have to come into a clinic for Vitamin C infusions, ideally every few days for months and even years, often much longer than conventional therapies, because Vitamin C seems to take that long to kill cancer cells. And with few clinics in the United States utilizing intravenous Vitamin C, it is very difficult for people to continue the therapy. But this drawback could be an easy fix. Again, as Mr. Planck said, we will not triumph by convincing the opponents, but rather by educating the people so that the next generation will be familiar and take the original research and progress it until scientific truth has been achieved. I learned in grade school that "a picture is worth a thousand words"—and what better way to educate the people than pictures! The average person knows nothing about cancer markers and cytokines so reading research does not appeal to them, but everyone loves pictures! It has been our idea to gather case studies of utilizing Vitamin C with skin cancers and documenting with pictures. These pictures will get the attention of not only the scientific community but also "the people"—and who knows, in 10–15 years maybe every small town will have an infusion center so IV Vitamin C can be something we can all get on our lunch hour. It could happen and we can certainly have a dream too! Nothing will progress without an imagination and as Albert Einstein said, "Imagination is more important than knowledge," especially when it comes to real innovation.

World Leaders in IV Vitamin C

San Juan, Puerto Rico

In February Riordan Clinic hosted an **IVC Academy** in San, Juan Puerto Rico. Doctors and professionals from around the world learned about using IV Vitamin C to treat chronic illness in their practices. The conference was packed with two days of lectures from four speakers and hosted attendees from the US, Puerto Rico, Colombia, Peru, Slovania, Nigeria, Korea, Ecuador and Canada.

Thank you to all who attended! We are looking forward to continuing our mission to bring IVC around the globe at our next conference: **the IVC & Chronic Illness Symposium, October 13 – 15, 2016 in Wichita, KS. Find out more at IVCandCancer.org.**

Lima, Peru

Last November the Colegio de Ingenieros del Peru and Instituto Cancerologico invited our Director of Research, Nina Mikirova Ph.D, to speak about Vitamin C Research for Cancer and Nutrition. She spent 3 days and spoke to two groups totaling 150 participants.

Mikirova has been with the Riordan Clinic since 1997.

Vitamin C continued from page 4...

Other antioxidants, such as fish oil, Vitamin A, Beta-Carotene, and Vitamin C act synergistically with chemotherapy and radiation. Vitamin C is one of the safest and least toxic therapies that can be administered to a patient, regardless of the diagnosis. Very large doses orally and intravenously have been given for extended periods of time with no significant problems occurring. There are few, if any, prescription, non-prescription medicines or supplements that are as free of side effects as Vitamin C. If high doses are not titrated up gradually, the oral Vitamin C can cause gas, stomach irritation, and diarrhea. This is actually seen more often in "well" patients, and appears only rarely in the "very sick" patients who have a very high need for it. Intravenous Vitamin C also needs to be given in graduated doses until achieving the high dose range.

We have had numerous testimonials; from patients coming in for their intravenous Vitamin C infusions that tell us they would never have made it through the chemotherapy regimen as easily without the support of the Vitamin C infusions. The infusions seem to help them maintain their energy level and sense of well-being; and in some cases help relieve pain. The nursing staff has witnessed Vitamin C to be a significant factor in maintaining and restoring health.

If a patient decides to use nutrition in conjunction with traditional medicine therapies, they can share their plan with their oncologist and ask for his/her cooperation and partnership. Patients who use nutritional supplementation for cancer therapy should always be supervised by knowledgeable medical personal for their own safety and best results.

References:
Beating Cancer With Nutrition by Patrick Quillan, PHD, RD, CNS and Vitamin C, Infectious Diseases, and Toxins by Thomas Levy, MD, JD.

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Intravenous Vitamin C in Cancer and Chronic Infections

THE AUTHOR

Paul S. Anderson, NMD
Anderson Medical Specialty Associates
Seattle, WA

Intravenously administered high dose ascorbic acid (HDIVC), as used in cases of patients with cancer and chronic infection, has considerable mythology surrounding it. The purpose of this review is not to exhaustively recap the data regarding this therapy, but rather to address basic issues of safety, pharmacology and outcomes of ongoing research.

I have been involved in the use of HDIVC for over 20 years, and have found it to be one of the most versatile and clinically useful agents in cancer and chronic illness I have used. It is not a panacea, but it also is not a placebo.

Safety:

Paramount in the decision to include a particular therapy for any condition is the safety of that treatment. The bottom line with respect to HDIVC is that in properly screened patients, it is an extremely safe intervention. In a 2010 review (4) there were five reported serious adverse events in the literature. Of these, one was hemolysis in a patient with G6PD deficiency (G6PD is an enzyme used in red blood cells to reduce hydrogen peroxide to water) and the balance were renal complications (in patients with preexisting renal disease or insufficiency).

All patients are pre-screened for multiple conditions prior to any HDIVC, and particular attention is paid to G6PD status, renal function and other co-morbidities. Deficient G6PD and renal insufficiency are contraindications for HDIVC.
In a review of the five cases mentioned, all could have been prevented with proper screening as recommended in current protocols.

Pharmacology:

The major concept behind HDIVC and cancer is that it is used as a pro-drug for the production of hydrogen peroxide in the extracellular space, thus potentially damaging the cancer cells (4). Is there any evidence of this potential? First, orally administered Vitamin C is unable to create a plasma level high enough to create any substantial peroxide formation (1,5). Second, it has been demonstrated that HDIVC properly dosed can create the type of peroxide surge in the extracellular space required to potentially damage cancer cells (5). Finally, it has been shown that some cancer cells have decreased ability to defend against the peroxide, where normal human cells can reduce the peroxide to water (1) – making HDIVC a potential anti-cancer pro-drug.

Our protocols are designed to ensure safety first. They are followed by measurement of post-HDIVC blood ascorbate levels to assure the effective peroxide forming dose for each patient. The data deriving these protocols and the formulas are published after presentation at the Society for Integrative Oncology (13).

HDIVC and Other Chemotherapeutic Agents:

A great deal of confusing information regarding the appropriate place and timing for the administration of HDIVC with other chemotherapeutic agents exists. Currently, an up- to-date review of all available data in this arena is being completed by the author (14).
A quote from a recent peer reviewed publication reveals the overall direction the data are pointing: “Clinical investigation of pharmacologic ascorbate should be considered as an addition to existing cancer treatments. Its mechanism of action as a pro-drug for H2O2 generation is distinct from most currently used agents. For this reason, there is potential for synergy, or at least an additive effect, in combination with other drugs. This strategy is similar to that used for treatment of many cancers, tuberculosis, serious bacterial infections, hepatitis, and HIV. Emerging data indicate that there are additive effects of ascorbate with other neoplastic agents” (11). A review of available data in 2008 summarized multiple existing cancer therapies and their effect in combination with ascorbate and found all agents either not affected or enhanced by ascorbate (9). This review had one exception which was the agent bortezomib, but later clinical data showed that even this agent had synergistic effect

Intravenous Vitamin C in Cancer and Chronic Infections continues on page 7...

with HDIVC (10). More study needs to be done, but data published between late 2011 and 2012 also reveal only positive additive effects using HDIVC in combination with existing cancer treatments (7).

In the case of "chemotherapy" as applies to antibiotic, antifungal, antiviral or other medications I use HDIVC in sequence or concurrently with these agents daily. We see only clinical synergy and improved outcomes over the use of the prescription agents alone.

HDIVC and chronic infections:
I have used HDIVC in the context of a comprehensive functional medicine approach to chronic infections for two decades. It is an excellent first line agent in the case of an acute illness such as influenza, mononucleosis or the like, as well as many chronic infections. In our practice we will use it in series with intravenous artesunate or other prescription antimicrobials in cases of recalcitrant infection. In the case of an acute infection the sooner one can infuse the HDIVC the better. In cases of chronic infection the use of HDIVC is as part of an overall protocol, but still crucial to the management of the case.

Ongoing Research:
Published reviews of HDIVC agree that there is limited data to support or to disprove the efficacy of this intervention in cancer patients (1,3,4,5). These authors agree that more data needs to be collected in order to verify the use of this intervention for cancer patients. In addition to many anecdotal reports regarding the positive benefits of HDIVC in cancer situations (4), two recent presentations reported a 50% positive outcome in a small sample of stage 4 cancer patients following data over a 2.5 year timeframe (6,7). A recent review of published data regarding intravenous ascorbic acid supports the above assertions as well as supporting the idea that this therapy has a role in treating the patient who has cancer (12).

While we have only preliminary outcomes data as yet regarding the success rate of HDIVC, it is viewed as a safe and potentially effective treatment in a medically supervised environment from the point of view of the larger medical community. **In my personal experience it is one of the most safe and effective agents to use in the course of treatment of infections as well as an excellent quality of life agent in clinical oncology.**

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Clinic Feature

Have you ordered your IV Vitamin C yet?

THE AUTHOR

Chris Brannon
RN, BSN
Clinic Manager

With the changes to compounding regulations and scarcity of products due to national shortages, we encourage you to please check with one of our Nurses to make sure we have ordered AND received your IV products before your next appointment. While we are doing our very best to have multiple suppliers for your items we are still facing the challenges of delays.

Our reason for pre-ordering your IV Vitamin C and other compounded products is to help keep the costs of your IV's down. With specifically Vitamin C, we previously had the ability to order it in larger quantities (at a reasonable price) and have it on the shelves ready when you needed. Now those prices have skyrocketed and we feel are not reasonable. The answer is for us to order your products from a compounding pharmacy.

A few things to remember when ordering:

- IVC requires a prescription which means your order is for you and *only you.*
- It is not returnable and non-refundable.
- These products do expire. Please check with the Nurses and ask what the expected expiration is for each item.
- Depending on the products ordered it takes an estimated two weeks to receive it at our clinic.

If you are in need of an IV but have not pre-ordered your Vitamin C we are still able to give you a treatment, but please understand it will be at a higher cost. We will make every effort to make sure you are aware of the cost prior to any therapy.

Please feel free to ask any of the Nurses if you have questions.

316.682.3100

IN GRATITUDE.....

As a not-for-profit organization, we rely on many to make our vision a reality. So many come together to provide our patients with a place of hope, health and healing.

Thank you to all individuals and groups who have donated to our clinic through financial support, including our staff in 2015. The following is the acknowledgement of contributions through our levels of giving;

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Riordan Clinic

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The Riordan Clinic treats 1000 patients each year. 85% of these patients benefit from our vitamin C research.

Optimal Kids is our newest program for children with health and behavior concerns.

Dr. Ron Hunninghake works tirelessly at teaching other physicians worldwide what we do here at the Riordan Clinic. He speaks to 2,500 physicians a year who are interested in our Vitamin C research.

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RIORDAN CLINIC BEAUTIFICATION: Our facility is 30 years old and updates to our facility are always necessary.

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