



The Benefits of IV Vitamin C

A treatment for Cancer

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The impact of cancer is astronomical. About 559 650 Americans are expected to die of cancer this year, that is more than 1 500 people a day. In the US, cancer accounts for 1 out of every 4 deaths. The National Institutes of Health estimate overall costs for cancer in 2006 at \$206.3 billion. The risk of developing cancer increases with age. 77% of all cancers are diagnosed in persons 55 and older. To put this into perspective 1 in 12 males and 1 in 11 females between the ages of 40-59 and 1 in 6 males and 1 in 9 females between the ages of 60-69 will develop cancer¹.

With the aging of the population there has been very little change in regards to the therapeutics that are being offered to the cancer patient today. The standard procedure, again depending on the cancer, is chemotherapy, surgery and or radiation. More and more money is being poured into cancer research but from the research lab to actual clinical practice the impact to cancer patients cannot come fast enough. So what can be done now? What can we naturopathic doctors offer the cancer patient sitting in our office today?

Vitamin C and Cancer

Some thirty years ago in a hospital in Scotland important discoveries with regards to vitamin C and cancer were taking place. Since that point vitamin C, specifically its impact on cancer has been the most researched and controversial vitamin utilized by naturopathic doctors for cancer therapy. In fact several theories on vitamin C and cancer have been around even prior to the famous Vale of Leven hospital trials. In 1954 and 1959 Dr.W.J.McCormick, a Canadian physician formulated the hypothesis that cancer is a collagen disease, secondary to a deficiency in vitamin C.² With this initial step we naturopaths and more importantly our patients have been able to benefit from this research. We have a therapy that can have a great impact on our patients diagnosed with cancer.

This research has indicated that only intravenous vitamin C can achieve a level within the plasma that is cytotoxic to cancer cells but not toxic to normal cells.³ Oral administration cannot achieve this cytotoxic level. Pharmacokinetic studies have shown that extracellular vitamin C at concentrations greater than 1000 $\mu\text{mol/L}$, is toxic to cancer cells. Large oral doses of vitamin C (18g/day) will increase plasma concentrations only modestly, from 70 $\mu\text{mol/L}$ to a maximum of 220 $\mu\text{mol/L}$, whereas intravenous administration raises plasma concentrations as high as 14 000 $\mu\text{mol/L}$.^{3,4} Intravenous vitamin C can act as a chemotherapeutic agent with none of the side effects typical of the conventional chemotherapy. Importantly in order to achieve these levels for a prolonged time, dosage and duration is important.⁵

Vitamin C and Cancer

Unfortunately for the patient that has just been diagnosed with cancer, the majority of oncologists will vehemently oppose the use of intravenous vitamin C. Reasoning that the vitamin C along with all antioxidants will negate the impact of chemotherapy. Although evidence have shown that antioxidants do not interfere with chemotherapy or radiation therapy and can in fact increase kill and increase survival.^{6,7}

Vitamin C is not the magic bullet. However it empowers the patient to face this challenge before them allowing the patient to have some form of control over this disease. It will help with their quality of life and it will help the fight against the cancer.⁸

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I would like to present 3 cases. All of these patients receive 50g of vitamin C intravenously, and take 250mg of alpha lipoic acid, a water and lipid soluble antioxidant that recycles vitamin C and can enhance the tumor toxic effects of vitamin C.⁵ The days between intravenous vitamin C, it has been recommended to take oral vitamin C to bowel tolerance. All the appropriate blood work have been reviewed. However practicing in Canada there are many obstacles to overcome and we at the clinic rely heavily on the patients to obtain certain blood markers and test results.

Case Study 1

Female, 36 years old, occupational therapist.

History:

- Weight, 134 lbs; height 5'5"
 - Invasive ductal carcinoma stage IV, right breast
 - 6 of 9 axillary lymph nodes contain metastatic carcinoma
 - Metastases to the liver, biggest lesion= 2.1 cm x 1.3 cm
 - Mastectomy and chemotherapy (once every three weeks)
 - IV Vitamin C therapy began July 2007, 3xweek
- In Oct. 2007, an abdominal MRI was performed.
- Significant improvement in the liver metastases
 - Largest lesion measures 1.6 cm x 0.7 cm
- In Feb 2008, patient had follow-up with her oncologist
- Largest lesion has completely resolved
 - Physician stated this is the first time he has seen this level of improvement with a Stage IV invasive ductal carcinoma.
 - Tx protocol to continue IV ascorbates 1X/week for a minimum of six months.
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Case Study 2

Male, 56 years old, letter carrier

History:

- Recurrent renal cell carcinoma
- 2002: Papillary renal cell carcinoma stage 1
- Laparoscopic nephrectomy of the right kidney in 2002 with no evidence of distant disease
- Follow-up unremarkable
- Presented to physician with fatigue
- Testing revealed elevated liver enzymes
- March 2006: CT scan revealed 3cm oval mass on the left renal vein and inferior vena cava
- Biopsy revealed recurrent high-grade renal cell carcinoma
- Trial chemotherapy suggested; patient refused
- Surgery refused
- Bone scintigraphy was unremarkable
- IV vitamin C therapy began in Aug 2006, 2X/ week to current.

In Dec. 2006, a CT scan of the abdomen and pelvis was performed.

- Previously seen nodal mass has resolved
- Left kidney shows no mass lesion
- No liver metastases
- Gallbladder, pancreas, spleen, left adrenal gland appear unremarkable
- No ascites
- Bowel is unremarkable
- No evidence for metastatic osseous lesions

Conclusion: interval reduction of retrocaval lymphadenopathy with only a residual aortocaval lymph node at 1.0cm.

In June 2007, a CT scan was repeated.

- Aortocaval lymph node has increased in size from 1.0cm to 1.7cm
- No other site for metastatic disease identified

The patient's oncologist has suggested since the start of treatment that the patient begin chemotherapy, which he continues to refuse. To date a CT scan and MRI are pending.

Blood Work:

	Aug, 2006	Sept, 2006	March 2007	Nov. 2007
AST	525(5-45 U/L)	29(5-45 U/L)	38(5-45 U/L)	38(5-45 U/L)
Alk. Phos	98(43-122 U/L)	86(43-122 U/L)	104(43-122 U/L)	85(43-122 U/L)
Lactate dehydrogenase	3137 (297-537 U/L)	390(297-537 U/L)	567(297-537 U/L)	453(297-537 U/L)

Source: Valley Hospital, Toronto

Case Study 3

Male, 50 years old, pilot

History:

- Weight, 185lbs; height, 6'2"
- Colorectal carcinoma, metastases to the liver
- Baseline CT scan showed numerous lesions throughout the liver; largest measures 10cm
- Chemotherapy suggested, oxaliplatin and 5-fluorouracil
- Given five months to live.
- IV Vitamin C therapy began in July 2005, 3x/week

In Sept, 2005, a CT scan of the abdomen and pelvis was performed.

- Mild decrease in the size of the multiple diffuse liver metastases
- Largest lesion now measures 8.7cm (previously: 10cm)
- Soft tissue mass adjacent to the sigmoid colon is now 0.6cm(previously 0.84cm)
- Weight 195lbs

In Nov. 2005, a CT scan of the abdomen and pelvis was repeated.

- Considerable improvement in the multiple diffuse hepatic metastases
- Soft tissue mass adjacent to the sigmoid colon resolved

In Jan 2006, a CT scan of the abdomen and pelvis was repeated.

- Decrease in the size of many lesions
- One lesion measures 2.8cm (previously; 3.8cm)
- Largest lesion measures 7.5cm (initially: 10cm)
- Weight: 205lbs

In April 2006, patient died suddenly. An autopsy was not performed; however, the patient's physicians attribute cause of death to cancer.

Blood Work:

	July 2005 (prior to therapy)	After 3 IVs	Sept. 2005 (chemo + IV)	Nov. 2005 (chemo +IV)	Jan, 2006 (chemo +IV)
Carcino-embryonic Antigen (CEA)	9534<5.0ug/L	6680<5.0ug/L	3000<5.0ug/L	645.2<5.0ug/L	488<5.0ug/L

Source: Valley Hospital, Toronto

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Michael Um, ND received his ND degree from CCNM, and his honors bachelor degree in the human biology specialist program from the University of Toronto.

During his undergraduate years, Dr. Um worked with a clinical biochemistry research team at the hospital for Sick kids in Toronto. While there, he worked on research regarding multiple sclerosis. Then, while attending CCNM, Dr. Um attended patients both on and off campus, including Anishnawabe, an external naturopathic clinic for the aboriginal community, and at the People With Aids external naturopathic clinic, which provides free service to HIV-positive patients.

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