

ANTIOXIDANTS AND CHEMOTHERAPY

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According to as recent analysis of 5 year survival rates, oncology has contributed little to the cure of cancer. Credit for the fight in cancer has to go to the diagnosticians, surgeons, radiologists, histopathologists and radiotherapists.

With chemotherapy contributing a 2.3% success rate in solid adult cancers over 5 years as opposed to a 60% cure rate by others in the medical profession, to come out swinging from this position is audacious in the extreme.¹

Who really is the emperor with no clothes?

The failure of chemotherapy can be attributed to the real phenomenon of chemo resistance and anything that can be done in this area will be of great benefit to cancer sufferers.

Chemotherapy in its current form is not the answer as a long term cure for cancer. Every new drug that is used runs into the problem of chemo resistance and toxic side effects. To say we don't know why this is happening is not correct. Any endeavour to research molecular biology, cell signalling chemistry and receptor biology will highlight the reasons why chemotherapy is failing our patients.

Common practice in oncology is to denigrate the use of antioxidants in combination with chemotherapy. This is because antioxidants supposedly negate the free radical formation at the mitochondria which in turn causes apoptosis to the tumour cell. However, it is this unopposed free radical formation that stimulates inflammation and the activity of transcription factors such as NF Kappa B that lead to its long term failure. NF Kappa B is effectively inhibited by natural substances such as Green Tea and Genistein whilst supporting the apoptotic effect of chemotherapy.²³⁴⁵⁶⁷⁸

Professor Avni Sali from Swinburne University in Melbourne, when asked about the results of a Meta analysis of randomised studies comparing the use of antioxidants, said different authors seem to be coming up with different results.

My reading of the situation is that certain antioxidants such as Vitamin A and possibly Vitamin E are not helpful and these antioxidants have no place in oncology practice. However, there is no evidence in my opinion that other antioxidants have a negative effect. On the contrary some of the studies on antioxidant trials conclude the use of antioxidants is helpful in conjunction with other cancer treatments. The evidence points to a decrease in side effects, the possibility of longer sustained chemotherapy with higher doses while some studies suggest improved long term outcomes.⁹¹⁰¹¹¹²¹³¹⁴ In the latest review by Block et al, published in INTJ cancer in May 2008, he states "Our analysis suggested in fact that the concurrent use of supplements and chemotherapy treatments might produce better tumour responses and increased survival."¹⁵

So why are patients, knowing the dismal results of long term chemotherapy and requesting to use some form of natural therapy in conjunction with chemotherapy met with such resistance and contempt? If there was clear evidence of harm from natural therapy this would be understandable. However no such evidence exists, except for the two antioxidants mentioned above.

I have spent the last twenty years studying the effects of natural therapies in cancer. I belong to the College of Nutrition and Environmental Medicine. This college teaches nutrition to Doctors and allied professionals.

Biochemistry and nutrition are taught minimally in medical school and I believe strongly that postgraduate training in nutrition as provided by the College of Nutrition and Environmental Medicine is a necessary requirement to fill this gap

The basis of abnormal cell functioning is aberrant biochemical functioning. The advances in biochemistry, molecular biology, cell signalling chemistry and cell receptor chemistry have been huge in the last eight years. Any reading of this material will show the enormous research that has gone into the use of natural substances in medicine.

There is a large proportion of the public that want an integrated approach using natural medicines alongside conventional pharmacology. Denigrating the doctors who can provide this and are trained in this area only creates division. The result will be a further movement of patients into the non medical world of untrained practitioners where there is little regulation.

I would like to see more interaction in this area for the benefit of the patients. I invite more informed discussion on natural medicine's role in oncology so that patients are not caught up in the middle where they will not benefit. All members of the medical profession, including those who believe that natural substances have a role to play in the care of cancer patients, should be invited to develop strategies and discuss pro's and con's and thus provide the best information that patients can then use to make a decision regarding their own treatment.

¹ The Contribution of Cytotoxic Chemotherapy to 5 year Survival in Adult Malignancies.

Graeme Morgan*, Robyn Ward, Michael Barton

Clinical Oncology (2004) 16: 549 – 560 doi: 10.1016/j.clon.2004.06.007

² Inhibition of Nuclear Factor kB Activation in PC3 Cells by Genistein is Medicated via Akt Signalling Pathway

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³ Cisplatin up-regulates ICAM-1 expression in endothelial cell via a NF-kappaB dependant pathway.

Yu M, Han J, Cui P, Dai M, Li H, Zhang J, Xiu R.

<http://www.ncbi.nlm.nih.gov/pubmed/18271937?ordinalpos=2&itool=EntrezSystem2>

⁴ Apoptosis-inducing effect of chemotherapeutic agents is potentiated by soy isoflavone genistein, a natural inhibitor of MF-kappaB in BxPC-3 pancreatic cancer cell line.

Li Y, Ellis KL, Ali S, El-Rayes BF, Nedeljkovic-Kurepa A, Kucuk O, Philip PA, Sarkar FH.

[Http://www.ncbi.nlm.nih.gov/pubmed/15097869?dopt=Abstract](http://www.ncbi.nlm.nih.gov/pubmed/15097869?dopt=Abstract)

⁵ Inactivation of Nuclear Factor kB by Soy Isoflavone Genistein Contributes to Increased Apoptosis Induced by Chemotherapeutic Agents in Human Cancer Cells.

Yiwei Li, Fakhara Ahmed, Shadan Ali, Philip A. Philip, Omer Kucuk, and Fazlul H. Sarkar

Cancer Res 2005; 65: (15) August 1, 2005, www.aacrjournals.org

⁶Genisten sensitizes diffuse large cell lymphoma to CHOP (cyclophosphamide, doxorubicin, vincristine, prednisone) chemotherapy
Ramzi M. Mohammad, Ayad Al-Katib, Amro Aboukameel, Daniel R. Doerge, Fazlul Sarkar, Omer Kucuk. *Molecular Cancer Therapeutics*

⁷ Nuclear Factor-kappa B as a Resistance Factor to Platinum-Based Antineoplastic Drugs
Vilma Maldonado Lagunas, Jorge Melendez-Zajgla
Hindawi Publishing Corporation, *Metal Based Drugs* Volume 2008, Article ID 576104, 6 pages
Doi:10.1155/2008/576104

⁸ Synergistic effects of protein tyrosine kinase inhibitor genistein with camptothecins against three cell lines in vitro

Konstantinos T. Papazsis, Theodora G. Kalemi, Dimitra Zambouli, George D. Geromichalos, Alexandros F. Lambropoulos, Alexandros Kotsis, Lazaros L. Boutis, Alexandros H. Kortsaris
Cancer Letters, www.elsevier.com/locate/canlet

⁹ Antioxidants and Other Nutrients do not Interfere with Chemotherapy or Radiation Therapy and can Increase Kill and Increase Survival, Part 1

Charles B Simone II, MD; Nicole L Simone, MD; Victoria Simone, RN; Charles B. Simone, MD
Alternative Therapies Jan/Feb 2007. Vol 13. No 1

¹⁰ Antioxidants and Other Nutrients do not Interfere with Chemotherapy or Radiation Therapy and can Increase Kill and Increase Survival, Part 2

Charles B Simone II, MD; Nicole L Simone, MD; Victoria Simone, RN; Charles B. Simone, MD
Alternative Therapies Jan/Feb 2007. Vol 13. No 2

¹¹ Should Patients Undergoing Chemotherapy and Radiotherapy Be Prescribed Antioxidants?

Ralph W. Moss, *Integrative Cancer Therapies*. <http://ict.sagepub.com>

¹² Chemotherapy Alone vs. Chemotherapy Plus High Dose Multiple Antioxidants in Patients with Advanced Non Small Cell Lung Cancer.

Ashutosh Kumar Pathak, MBBS PhD; Manisha Bhutani, MD DM; Randeep Guleria, MD, DM; Sabyasachi Bal, MS; Anant Mohan, MD; Bidhu K. Mohanti, MD; Atul Sharma, MD, DM; Raminder Pathak, MBBS; Narendra K. Bhardwaj, MBBS; Kedar N. Prasad, PhD; Vinod Kochupillai, MBBS, FRCP

[Http://www.jacn.org.dbgw.lis.curtin.edu.au/cgi/content/abstract/24/1/16](http://www.jacn.org.dbgw.lis.curtin.edu.au/cgi/content/abstract/24/1/16)

¹³ Mortality in Randomized Trials of Antioxidant Supplements for Primary and Secondary Prevention
Goran Bjelakovic, MD, DrMedSci; Dimitrinka Nikolova, MA; Lise Lotte Gluud, MD DrMedSci; Rosa G. Simonetti, MD; Christian Gluud, MD, DrMedSci

JAMA Vol.297 No. 8, February 28, 2007, <http://jama.ama-assn.org/cgi/content/abstract/297/8/842>

¹⁴ Use of Antioxidants During Chemotherapy and Radiotherapy Should be Avoided

Gabriella M. D'Andrea, *CA Cancer J Clin* 2005;55:319-321 DOI: 10.3322/canjclin.55.5.319

¹⁵ Impact of antioxidant supplementation on chemotherapeutic toxicity: a systematic review of the evidence from randomized controlled trials.

Block KI, Koch AC Mead MN, Tothy PK, Newman RA, Gyllenhaal C.

<http://www.ncbi.nlm.nih.gov/pubmed/18623084?ordinalpos=19&itool=EntrezSystem2>