

BECAUSE there is little funding for studies of natural approaches, we present some from the past.

## Vitamins Affect Bladder Cancer Treatment

### Vitamins C, K3 Maximize Chemotherapy

In a recent study, researchers evaluated the anti-tumor effects of vitamins C and K3 in bladder cancer. They also looked at the possibility of combining the vitamins to make bladder tumors more sensitive to chemotherapy.

#### Significance of results

Metastatic urothelial cancer of the bladder typically is treated with various combinations of systemic chemotherapy. However, most patients with distant metastatic bladder cancer do not survive more than one to two years despite treatment with the most effective regimens available.

To improve the results of bladder cancer treatment, nontoxic agents that make chemotherapy more effective are needed.

#### Background

Urothelial cancer of the bladder is the fourth most common solid malignancy in men and the ninth most common malignancy in women in the United States. In 2004, more than 12,000 people in the United States died from this cancer.

Investigators are studying certain vitamins that hold promise in treating bladder cancer. An emerging body of evidence has demonstrated the benefit of combining vitamins C and K3 for cancer treatment.

“Vitamins C and K3 have shown significant anti-tumor activity when used in combination against breast cancer cells and other solid malignancies,” says Wassim Kassouf, M.D., a former fellow of the Urologic Oncology program at M. D. Anderson and an investigator on the study directed by Ashish Kamat, M.D., assistant professor in the Department of Urology. “These biological effects of the vitamins initiated our interest.”

Vitamin C is an antioxidant that is known to be effective against several types of cancer cells, including melanoma, neuroblastoma and epidermoid.

Vitamin K3 has shown promise in treatment of lung, colon and cervical cancer.

#### Research methods

In the laboratory, scientists examined the effects on bladder cancer cells of:

Vitamin C Vitamin K3 Vitamins C and K3 Gemcitabine (a chemotherapy drug) Gemcitabine with vitamins C and K3

They also injected laboratory mice with one of the following for four weeks:

Saline (salt water) Vitamins C and K3 Gemcitabine Gemcitabine plus vitamins C and K3

#### Primary results

This study, which was published in The Journal of Urology in October 2006, showed that vitamins C and K3 have significant effects on bladder cancer cells when used together. The combination also enhances the effectiveness of gemcitabine against bladder cancer at the cellular level.

In the laboratory, the following percentages of cancer cells were killed:

32% with gemcitabine plus vitamins C and K3  
5.3% with gemcitabine 15.8% with vitamins C and K3

#### What's next?

Further studies are being conducted to define exactly how vitamins C and K3 act in bladder cancer cells.

“These clinical data provide evidence to consider vitamins C and K3 as a means of enhancing the efficacy of gemcitabine-based chemotherapy in bladder cancer,” Kassouf says.

Source: MD Anderson Cancerwise, March 2007

Remember we are NOT Doctors and have NO medical training.