

# Nutritional Supplementation for Nausea and Emesis in a Breast Cancer Patient

Lisa Colodny, Pharm D. BCNSP

## Introduction

Nausea and vomiting are common complaints of oncology patients who receive chemotherapeutic agents (a,b,d,e,f, h). Depending upon the chemotherapeutic regimen, the degree of nausea and emesis reported by patients may vary, ranging from mild with lowly emetogenic regimens to severe with highly emetogenic regimens. Although significant progress has been made in developing more effective means of preventing nausea and vomiting induced by chemotherapy, incomplete or uncontrolled emesis remains a problem for a significant percentage of cancer patients (a, i).

Chemotherapy-induced emesis may actually be classified into acute and delayed phases. The acute phase includes emesis up to 24 hours after the chemotherapy is completed. Patients who experience delayed phase do not suffer emesis until greater than 24 hours post chemotherapy treatments (B). While newer agents such as the 5HT<sub>3</sub> receptor antagonists (Ondanesetron, granisetron, and dolasetron) are very effective in controlling emesis during the acute phase, they are less effective during emesis that occurs during the delayed phase (b).

The mechanism of chemotherapy-induced nausea and vomiting is not completely understood. However, an interaction between chemotherapeutic agents and the nausea trigger zone has been implicated as a probable cause (c & ?). Other proposed mechanisms may be related to tumor metabolism itself, the metabolic and the response of the body to cytokine release, as well as the surgery, chemotherapy, or radiation the patient may undergo (s). In addition, several risk factors have been identified that may predispose a chemotherapy patient to chemotherapy induced nausea and vomiting (j). These include female sex, patients between the ages of 6 and 50 years, and those who drink little or no alcohol (k). Regardless of etiology, chemotherapy induced nausea and vomiting remains the most feared side effects of many chemotherapy regimens (d).

## Objective

To evaluate the effectiveness of nutritional supplementation for controlling nausea and emesis in an oncology patient undergoing treatment with chemotherapeutic agents documented to produce or exacerbate nausea and vomiting.

## Case History

Mammography for a 52 year old female identified several clusters of micro-crystallizations dispersed through a 1.5 cm mass located on the right breast. Needle biopsy confirmed an invasive interductal carcinoma in situ. A lumpectomy was recommended and performed. Three sentinel nodes were sampled and reported to be negative. Several other nodes downstream were sampled and were also negative for disease. However, cytokeratin stains were positive for a scarce amount of micrometastasis. Her estradiol level was above normal limits with a decreased E3/E1 + E2 ratio reflective of an estrogen sensitive tumor.

After surgery, the patient underwent chemotherapy with methotrexate, cyclophosphamide and 5-fluorouracil at standard doses. After the chemotherapy was initiated she experienced debilitating nausea for 3 days that was exacerbated by food for up to 45 minutes after meals. Additionally, she developed severe urticaria of greatest magnitude on the torso. At this time, she expressed a desire to discontinue chemotherapy. However, she agreed to be treated nutritionally with Propax, B12, B6, MSM, and glucomannan (powered Konjac root capsules) for 10 days. Subsequent cycles of chemotherapy were well tolerated without nausea or adverse reaction events. No further urticaria subsequently presented either during or post additional chemotherapy. Oth-

er medications administered during hospitalization included 3% USP progesterone cream and transbuccal DHEA.

### **Past Medical History**

Medications included: Conjugated estrogen, medroxyprogesterone, and thyroid. Patient history significant for hemi-thyroidectomy.

### **Discussion**

Many factors can influence the nutritional status of cancer patients, including cachexia, nausea, vomiting, decreased caloric intake, or oncology therapies (n). Although the influence of these factors on nutrition is not well defined, the relationship has been extensively studied. Tonosaki et al reported skin fold thickness as a nutritional indicator was significantly influenced by nausea and vomiting and also with infectious processes associated with elevated temperatures (o). Similarly, Sarna et al reported a parallel relationship between decreased calorie consumption and functional status in lung cancer patients over a 6 month period of time (r ).

In many cases, the antineoplastic regimens used to treat breast cancers may produce a number of unpleasant or intolerable adverse effects that can affect the therapy. Leukopenia and thrombocytopenia are more commonly reported adverse reactions associated with methotrexate than nausea and vomiting. Methotrexate at doses ranging from 20 to 40mg/m<sup>2</sup> every 1 to 2 weeks to 200 - 500mg/m<sup>2</sup> every 2 to 4 weeks are generally well tolerated with dermatologic and genitourinary side effects that includes skin erythema, rash, pruritus, urticaria, alopecia, photosensitivity, furunculosis, depigmentation of hyperpigmentation, acne, telangiectasia, bullae formation, and folliculitis.

Doses of cyclophosphamide greater than 600mg/m<sup>2</sup> are commonly associated with nausea and vomiting. The symptoms usually begin 6 to 10 hours after administration, and usually requires antiemetic therapy through this time period. In addition, patients may complain of a metallic taste during injection, nasal congestion, urticaria, angioedema, and facial flushing while receiving cyclophosphamide.

Fluorouracil is commonly associated with mucositis when administered as a 5 day infusion. The mucositis may occur as small, shallow ulcerations on the inner surface of the lower lip or buccal mucosa and may result in painful, erythematous tongue and generalized mouth sores. Higher doses may produce a severe cholera-like diarrhea which can become life threatening. Nausea and vomiting are not commonly reported adverse reactions associated with fluorouracil.

Regardless of the underlying cause(s) of the nutritional imbalance commonly observed in oncology patients, its impact on the patient's quality of life and survival has been continuously debated (s, z). Celaya et al reported that the cancer itself may negatively affect nutrition through tumor metabolism and metabolic response of the body to cytokine release. As a result the nutritional status of the patient is already impaired long before radiation or chemotherapy have been instituted (t). Therefore, effective nutritional support may be beneficial in this group of patients through enhance wound healing, augmented visceral function, and improved cellular immunity (x). This is supported by Chuntrasakul et al who reported significant improvement in nutritional and immunologic parameters in immunocompromised patients who received supplementation with arginine, glutamine, and omega 3-fatty acids (y). Similarly, Henquin concluded patients with poor nutritional status during chemotherapy deteriorated. While patients with good nutritional profiles maintained good clinical status. (Q). Therefore, prevention or reduction of malnutrition by adequate therapies may contribute to a reduction in morbidity and mortality in this population (A1).

The protective effects of fat-soluble and other natural antioxidants are well known<sup>(8)</sup>. These antioxidant defenses are important in determining immune cell integrity and functionality of membrane lipids, cellular proteins, and nucleic acids. Additionally, antioxidants are believed to control signal transduction and gene expression in immune cells<sup>(9)</sup>. There are several stages where antioxidants may control the progression and malignancy of disease. Antioxidants may also provide protection even when cancer-infected viral activity is present.

Therefore, dietary introduction of these nutrients may stimulate host immunological defenses and damage malignant cells directly by cycling with consequent oxygen radical production. The unique dietary supplement, Propax, addresses the nutritional concerns of oncology patients without resorting to mega dosing as in many immunosuppressive types of disease states. The formulation is composed of the complete antioxidant group and trace minerals, combined with water-soluble nutrients and essential fatty acids. To aid in the production of ATP, the formulation also includes phospholipids & creatinine, creatinine phosphate, tyrosine, and alpha glutarate. Finally, the formulation utilizes a unique delivery system that mimics the way the body utilizes nutrients<sup>(10)</sup>. These properties may be of benefit in treating the nausea and emesis commonly seen in patients with immunosuppressive disease who undergo treatment with chemotherapy and / or radiation. Although, well-controlled, blinded, clinical studies are required to draw definitive conclusions on the effectiveness of nutritional supplements like Propax, it may correlate with the positive results for decreased vomiting and nausea experienced by the patient studied.