Fats and Sugars —Why Should We Avoid Them?

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In the next few issues of The CBHP Report we will delve into the complex issue of nutrition and breast cancer. This is a wide and varied subject area fraught with conflicting studies and strong feelings on all sides. This issue will cover a discussion of the role of fats and sugars in disease processes, as well as touch on ways to lower our consumption of these foods. Due to the extensive body of literature that exists, this article will not be a systematic review, nor will it address all existing nutrition-related controversies. This article will instead focus on a few key issues and highlight some recent publications.

To begin the discussion, a report from the American Society of Clinical Oncology (ASCO) meeting in May of this year indicated that it is beneficial for breast cancer survivors to eat a low-fat diet[1] . The findings came from the Women's Intervention Nutrition Study (WINS), which is a federally funded study that began in 1994 of postmenopausal, early-stage breast cancer patients aged 48 to 79 years. The study recruited 2,400 women who were divided into two groups. One group went through eight weeks of nutritional counseling about cutting fat in their diets, and the other group went through counseling about eating a well-balanced diet but received no specific guidance about reducing fat intake.

The average reduction in fat intake for women in the low-fat diet group went from 29 to 20 percent of their daily caloric intake from fat while the women in the well-balanced diet group did not reduce their fat intake. Incidentally, the low-fat group consumed about 33.3 grams of fat per day while the well-balanced group consumed about 51.3 grams. After an average follow-up time of five years, 96 women on the low-fat diet (9.8%) had a breast cancer recurrence compared with 181 women (12.4%) in the well-balanced group. This was a 24% reduction in risk for the low-fat group compared to the well-balanced group. For women who had estrogen receptor negative tumors, the risk fell by 42% while the benefit for estrogen receptor positive women was negligible. This was probably because estrogen receptor positive women are usually taking tamoxifen or an aromatase inhibitor that is lowering their risk of recurrence already. A similar study is being conducted in women who have never had breast cancer in order to see if the low-fat diet is useful for breast cancer prevention.

It is important to remember that this nutritional approach only reduced risk—it did not eliminate it altogether. It is still possible for people with very healthy diets to get breast cancer because factors other than diet contribute to breast cancer risk. Such factors include genetic background, alcohol consumption, reproductive history, and probably some as yet undiscovered factors. The exciting point is that diet did seem to play a measurable role in breast cancer recurrence risk for estrogen receptor negative patients in this study, and diet is something that can be changed if desired.

The cancer and sugar connection is made through a family of proteins called insulin and insulin-like growth factors (IGF-1 & IGF-2). Insulin and the IGFs play a role in stimulating cells to take up glucose using proteins called glucose transporters which results in an increase in the metabolic activity of the cell. The cellular signal transduction pathways stimulated by insulin and IGF-1 can inhibit apoptosis (programmed cell death), stimulate cell proliferation, stimulate the synthesis of sex hormones like estrogen and progesterone, and inhibit the synthesis of sex hormone-binding globulin (SHBG) that then leads to increased binding affinity of sex hormones to their receptors on various tissues. IGF-1 especially plays a role in activating the enzyme cascade of signaling molecules called protein tyrosine kinases that signal cells to divide and has been implicated in breast cancer[2] . Insulin is produced by the pancreas in response to an elevated level of glucose in the blood. Insulin then binds to receptors on the cells and

mediates the uptake of glucose from the blood. In a person who consumes lots of sugar, has a high-fat diet, is overweight or obese, and is not physically active, a phenomenon called insulin resistance develops that predisposes that person to diabetes, heart disease, and quite possibly cancer. When an abundance of sugar is consumed and converted to glucose (hyperglycemia), lots of insulin is produced in order to keep the blood sugar level low. However, if the cells are consistently stimulated by insulin, they become resistant to it and it takes more insulin to get them to clear the glucose from the bloodstream. This occurs because the insulin receptors on the cells are decreased in number and/or do not bind to the insulin with a high binding affinity. This is called insulin resistance, and it has been associated with an increased disease risk[3] . The good news is that some degree of insulin sensitivity can be restored with a low-fat, low sugar, moderate exercise approach. This lowers the levels of insulin and the IGFs and makes them less available to stimulate the cells of the various tissues of the body, including breast tissue[4].

As for fats, several studies have investigated the issue of fat intake and breast cancer or cancer risk overall, and the results remain inconsistent. While the study just reported at the ASCO meeting indicates that a low-fat diet lowers the risk of breast cancer recurrence for estrogen receptor negative women, a study in 2004 published in the Journal of the National Cancer Institute[5] found that the benefits of a low-fat diet were primarily for cardiovascular disease and not for cancer. While the details of exactly how beneficial a low-fat diet may be are in question, it is clear that a low-fat diet is more beneficial than a high-fat diet, and this is certainly true for cardiovascular disease, which on its own, is reason enough to lower the fat content in one's diet. A diet rich in fruits and vegetables will not only be a low-fat diet, it will also be a diet rich in antioxidants, and antioxidants may be helpful in lowering cancer risk as well. If fat level does play a role in breast cancer risk one thing that it might do is allow an increased production of estrogen in the body which could stimulate breast cancer cells to grow. The United States Department of Agriculture (USDA) suggests that fat intake be limited to less than 30% of the total daily caloric intake.

The following nutritional information about fatty acids was developed by Natalie Ledesma at the Golden Gate Center for Integrative Cancer Care[6]. There are three types of fat, the first of which are saturated fats found in meat and dairy products. These are the fats to avoid because they raise the level of low density lipoproteins in the blood and this contributes to cardiovascular disease. They also raise insulin levels, and environmental contaminants like pesticides concentrate in saturated fats. Finally, these were the fats that were avoided in the ASCO study just reported and discussed above. This is why limiting the consumption of butter, mayonnaise, baked goods, meats, whole milk dairy products, and cheese is so often recommended. Second, there are trans-fatty acids or hydrogenated fatty acids, which also should be avoided since they may disrupt hormonal systems and encourage the development of cancer. Examples of foods that contain trans-fats are margarine, fried foods, and processed foods. Last, there are the three essential fatty acids: omega-6, omega-9, and omega-3. The omega-6 fatty acids may promote breast tumor development and metastasis. Sources of these fatty acids include meats, butter, milk and vegetable oils made of corn, safflower, sunflower, cottonseed, and soybean. The omega-9 fatty acids do not appear to increase the risk of cancer development. Sources of these fatty acids include extra-virgin olive oil, canola oil, almonds, and avocados. The omega-3 fatty acids may reduce breast cancer risk as well as enhance immune function. Sources of these fatty acids include cold-water fish (salmon, trout, herring, and sardines), flaxseeds, walnuts, and pumpkin seeds.

The USDA's new food pyramid (see Resource Box below) suggests guidelines for a healthy diet. When eating fish, be aware of the possibility of mercury or other heavy metal contamination. Eat fresh, wild fish when possible in order to avoid mercury or pesticide contamination. Farmed fish can be contaminated with pesticides since they are fed a grain-based diet that has been pesticide treated while on the fish farm. Fish from the San Francisco Bay should be avoided since they are contaminated with mercury and possibly other compounds. In addition to a healthy diet, exercise for an hour a day or as often as possible and avoid alcohol and smoking. Last, avoid processed foods since they contain high levels of sugar, salt, unhealthy fats, and white flour. Ideally whole foods that are as close to their original food source should be consumed as often as possible, including whole wheat foods.

The USDA's basic message is[7]:

* Eat at least three ounces of whole-grain cereals, rice, or pasta every day
* Emphasize fruits, vegetables, whole grains, and fat-free or low-fat milk and milk products in the diet
* Eat lean meats, poultry, fish, beans, eggs, and nuts
* Eat food and beverages low in added sugars, saturated fats, trans fats, cholesterol, and salt

Natalie Ledesma from the Golden Gate Center has more detailed recommendations:

* Eat 8-10 fruit and vegetable servings daily
* Eat 25-35 grams of fiber daily
* Limit intake of meats and whole milk dairy products
* Eat foods with healthy fats like cold-water fish, flaxseed, walnuts, soybeans, olive oil and avocados.
* Limit alcohol consumption.
* Drink one cup or more of green tea daily.

These guidelines are ideas only. Each reader will have to judge for herself or himself what will work with her or his lifestyle and beliefs about eating patterns. The alcohol and green tea recommendations are currently still under investigation. There may be some benefit to some types of red wine, and the helpfulness of green tea is not universally recommended. If you are interested in learning more about any of the issues surrounding diet and health, please see the accompanying Resource Box.

Last, please remember that these diet suggestions are not absolute and do not constitute the only factors involved in breast cancer risk. Some people who have very healthy diets and exercise regularly are still going to get breast cancer, and people with unhealthy diets and little exercise are not guaranteed to get breast cancer. These suggestions are meant to inform people who are interested in changing their diet about the ideas out there and to let them know where to get more information. So, happy reading, eating, and exercising!

BOOKS

* The Color Code, by James Joseph, PhD, Daniel Nadeau, MD & Anne Underwood, 2002
* Natural Health, Natural Medicine: The Complete Guide to Wellness and Self-Care for Optimum Health, by Andrew Weil, MD, 2004
* How to Prevent & Treat Cancer with Natural Medicine, by Michael Murray, 2002

COOKBOOKS

* Cancer Lifeline Cookbook, by Kimberly Mathai, & Ginny Smith, 2004
* One Bite at a Time, by Rebecca Katz, Marsha Tomassi, & Mat Edelson, 2004
* 12 Best Foods Cookbook: Over 200 Recipes Featuring the 12 Healthiest Foods, by Dana Jacobi, 2005

WEBSITES

* http://www.aicr.org
* http://www.cancernutritioninfo.com
* http://www.cancerrd.com
* http://cc.ucsf.edu/crc
* http://www.consumerlab.com

* Symposium Highlights—Omega-3 Fatty Acids: Recommendations for Therapeutics and Prevention, Institute of Human Nutrition, Columbia University College of Physicians and Surgeons, New York 2005. Available at http://www.medscape.com/viewprogram/4605_pnt. You will have to create an account with Medscape before you can view this article. CBHP also has the article available in our library.

* http://www.issfal.org.uk This site is run by the International Society for the Study of Fatty Acids and Lipids (ISSFAL). Their "Global Recommendations" section has an interesting table listing recommendations for fatty acid intake made by various nutrition and health associations worldwide, such as the World Health Organization.

1. UCSF Comprehensive Cancer Center & Golden Gate Center for Integrative Cancer Care

2. Chlebowski RT, Blackburn GL, Elashoff RE, et al. Dietary fat reduction in postmenopausal women with primary breast cancer: Phase III Women?s Intervention Nutrition Study (WINS). 2005 ASCO Annual Meeting Proceedings. Available at http://www.asco.org/ac/1,1003,_12-002640-00_18-0034-00_19-0031414,00.asp

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1. Chlebowski, RT, et al: Dietary fat reduction in postmenopausal women with primary breast cancer: Phase III Women?s Intervention Nutrition Study (WINS). Proc Am Soc Clin Oncol, 2005 (abstr 10)

2. Renehan, AG, et al: Insulin-like growth factor (IGF)-1, IGF binding protein-3, and cancer risk: systematic review and meta-regression analysis. Lancet 363:1346-53, 2004

3. Berra, K: Treatment options for patients with the metabolic syndrome. J Am Acad Nurse Pract 15:361-70, 2003

4. Notes from the 2005 CancerGuides training in Berkeley, California presented by the Center for Mind-Body Medicine & the Center for Spirituality and Healing at the University of Minnesota (available from CBHP)

5. Hung,H-C, et al: Fruit and vegetable intake and risk of major chronic disease. J Natl Cancer Inst 96:1577-1584, 2004 and accompanying editorial

6. Ledesma, N: General Nutrition Guidelines for Breast Cancer Survivors. Golden Gate Center for Integrative Cancer Care, 2005

7. www.mypyramid.gov