Cancer Prevention Laboratory

Colorado State University
Knowledge to Go Places

BreastWatch Times

Volume 3 Issue 2 Fall 2003

A Word From Henry

Special points of interest:

- Research News
- Answering questions on Genetic counseling

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Hello to all!

In our last newsletter we shared with you that our laboratory research team was moving from AMC Cancer Research Center to Colorado State University. I am glad to report that we have successfully completed the move and that the Cancer Prevention Lab is now fully operational at CSU! Not surprisingly, a move of the magnitude entailed by the size of our program took a little more time and effort than we had initially anticipated and has contributed to the lack of newsletters this year. Nonetheless, we have been hard at work and will again be publishing the newsletter on a regular basis.

Our BreastWatch program has been active since 1993. This issue of the newsletter provides an update on the program and information about eligibility for enrollment.

Accrual into our Enrich project, a study that is investigating the potential value of selenium supplementation for breast cancer prevention, has reached the half-way mark. Hurrah!!! A big thanks to all those participating and to our clinical team. Women who are at increased risk for breast cancer are eligible to participate. More information on the study is provided in this issue of the newsletter. We are eager to complete enrollment, so if you are interested in additional information, please call Becky Meinecke at 303-370-7924.

In this issue of our newsletter, we provide an article on questions about genetic counseling that was written by Lisa Mullineaux, a genetic counselor at Rocky Mountain Cancer Centers. We hope you find this information and the entire newsletter of value.

Individuals who participated in our cuisine program continue to ask when we will be launching the weight reduction project. We are working on the concepts and to securing funding. On a personal note, the Thompson family also is testing some new dietary strategies for weight loss!!! Until the program launches, here are a few websites you may find of interest.

Ideally your body mass index (BMI) should be under 25. For many individuals, a BMI of 20-22 is recommended. Here is a website that will allow you to check your BMI:

Calculate your body mass index: http://nhlbisupport.com/bmi/bmicalc.htm

If your BMI is greater than 25, you may want to consider lifestyle changes that will result in a lower body weight. Check out the following website to better understand your caloric needs relative to your activity level. Many health professionals recommend a weight loss of 1 pound per week. That would require you to eat 500 calories per day less than you expend, presuming that a pound of fat is equivalent to 3500 calories.

Estimate your daily need for calories: http://www.websurface.com/show/calorie.htm

Research News

BreastWatch is a program for women at increased risk for breast cancer. The original goals of the program were to 1) create a group of increased-risk women volunteers to participate in research in clinical issues related to the prevention and early detection of breast cancer and 2) provide ongoing standard clinical care for women identified as being at increased risk for the development of breast cancer. Since its inception in 1993, 603 women have been enrolled in the program and 456 remain active. We are glad to report that only 5.7% of this study population has been diagnosed with breast cancer. This is a very good thing. One of the goals of BreastWatch has been to examine risk factors relative to the occurrence of breast cancer. Only recently have the number of individuals with a diagnosis of cancer been sufficient to permit an initial statistical evaluation of whether the occurrence of cancer is associated with various risk factors on which we have collected information.

Breast Cancer Risk Factors

- Age
- Age at menarche
- Age at 1st live birth
- Number of first degree relatives with breast cancer
- Breast biopsies
- Gail Score

A number of factors have been used to identify potential risk for breast cancer. These include family history of breast cancer and the observation of abnormal appearing cells in a breast biopsy. However, what is very easy to lose sight of is that all the known risk factors apply to population of individuals with or without a specific characteristic, but not to the individuals themselves. That is, these factors cannot predict the risk for breast cancer of a specific individual. The results of our initial BreastWatch data analysis are consistent with this expectation. As we summarize in the following table, here are some of the "population based" risk factors that were not statistically different between women who were either diagnosed with breast cancer or who remain cancer free.

These data underscore what has been recognized for some time, there remains a need for research that identifies factors that can be used to determine an individual's specific risk for breast cancer. What is particularly exciting is that new developments in the ongoing biological-molecular revolution in science, now make it plausible for this difficult goal to be achieved.

In order for this objective to be realized, it is likely that cancer risk prediction markers will be identified in blood components, nipple aspirate fluid, and/or urine. As some of you who participated in our Biomarkers project or our Cuisine program know, we have been in search of breast cancer risk factors that can be modified by lifestyle. We will report on one such candidate biomarker in our winter issue of the newsletter.

Given that the Thompson led group has joined Colorado State University and that Dr. Sedlacek has been appointed as an affiliate faculty member in the Cancer Prevention Lab at CSU, we have decided to request that the Human Subjects Committee at CSU assume oversight responsibility for BreastWatch. The CSU committee has reviewed and approved the project. Because of this change, we are in the process of contacting all BreastWatch participants and asking them to sign a new consent form if they wish to continue in the program. Details of the program and some of its new optional components are provided in this newsletter.

We wish to acknowledge and thank all those who have participated in BreastWatch and our other research programs. Without your participation, our research cannot proceed. Because of your commitment of time and effort as well as that of many other women, the battle against breast cancer will ultimately be won.

Research Opportunities

Selenium and Breast Cancer Prevention

The purpose of this study is to determine whether selenium, taken as a tablet, causes changes in early indicators of breast cancer risk. The study is being conducted in a group of women at increased risk for breast cancer. Past research indicates that the amount and type of selenium can reduce deaths due to cancer of the lung, prostate, and colon. However, the effects of selenium on breast cancer have not been studied. That is the purpose of this project.

The change from a normal breast cell into breast cancer cells takes many years and occurs in many stages. It is thought that breast cells destined to become cancer display changes that can be identified by laboratory tests long before breast cancer occurs. Reversal of these changes by an agent such as selenium would suggest that we might be able to stop the cancer process. Due to selenium's antioxidant characteristics it may be possible to interrupt the chain of events that lead to breast cancer. The goal of this study is to determine whether taking selenium will decrease these cellular changes in the blood, urine, and breast which may then help to decrease the risk of breast cancer.

Role of Participants:

- You will be asked to schedule three clinic visits at no charge to you; baseline, 6 months and 12 months. At each visit you are asked to give a sample of blood and to provide three first void urine specimens. At the first and last clinic visit, a sample of nipple aspirate fluid will also be obtained (optional).
- You will be asked to take a selenium or placebo supplement along with a vitamin-mineral supplement on a daily basis for one year, at no charge to you.
- You will be asked to fill out a new BreastWatch questionnaire upon enrollment in the study, and fill out an update questionnaire at the end of the study.
- You will be asked to discuss any questions or concerns with the Clinical Coordinator at any time. Also, will also be asked to update your health and pregnancy (if applicable) status at the monthly follow-up calls.

Eligibility Criteria:

- Participant must be female
- Must not have been diagnosed with any type of cancer in the past (except basal or squamous cell skin cancer)
- Must be at least 21 years old
- Must be willing to limit alcohol consumption to 1 or less serving of alcohol per day (on average)
- Must refrain from using tobacco products
- Must not take a specific selenium supplement
- Must be willing to discontinue taking other vitamin-mineral supplements and take the vitamin-mineral supplement provided free of charge for everyone in the study. It is okay to continue Calcium supplements
- Must not be pregnant or lactating
- Must not intend to become pregnant during the study
- Must be a patient of Rocky Mountain Cancer Centers - Rose Office

*There are no costs to participate in this study apart from the costs associated with your regular clinic visit, and your annual mammography.

If you are interested in or have questions about the ENRICH study, please call Becky Meinecke at 303-370-7924 or email at becky.meinecke@colostate.edu

Answering Questions on Genetic Counseling
Lisa Mullineaux, MS, CGC

Recently there has been an increase of advertisements for BRCA 1 and BRCA 2 genetic testing for breast cancer risk. In light of these advertisements about hereditary breast cancer, we've asked Lisa Mullineaux, Genetic Counselor for Rocky Mountain Cancer Centers, to touch on some of the general questions women might have regarding BRCA 1 and BRCA 2 genetic testing.

What factors determine inherited risk for breast cancer?
Only 10% of all women with breast cancer have a significant family history that suggests an inherited risk. Inherited risk for breast cancer is suspected under the following circumstances:

- Breast cancer diagnosed at a young age (before age 50), especially if more than one family member has breast cancer.
- Family history of male breast cancer.
- Multiple family members, on the same side of the family diagnosed with breast cancer and/or ovarian cancer.
- Ashkenazi Jewish descent and breast cancer diagnosed less than age 50 or ovarian cancer diagnosed at any age.

What causes an inherited risk or predisposition to breast cancer?
There are several genetic factors that result in an inherited risk for breast cancer. Some inherited causes have not yet been identified. About half of all families suspected to have an inherited risk for breast cancer have inherited mutations or mistakes in known genes. The other half has an inherited risk that we are not yet able to identify. A gene is a recipe for a unique protein. A mutation in a gene causes the protein to be faulty. Mutations in tumor suppressor genes result in inherited risk for breast cancer. When normal, tumor suppressor genes make tumor suppressor proteins. These proteins protect the breast and other tissues from forming tumors. Faulty proteins can't do their job, which results in the higher risk for breast cancer.

What are some of the genes that are mutated, leading to inherited risk for breast cancer?
There are many different mutated genes associated with an inherited risk for breast cancer. The most common cause of inherited risk for breast cancer is mutations in the BRCA1 and BRCA2 genes. The lab that performs this testing, Myriad Genetics, has recently advertised on TV, radio and print about their genetic testing. The following is a list of genes that when mutated, lead to inherited risk for breast and other cancers:

- BRCA1/BRCA2- increased risk for ***breast*** *(*male and female), ***ovarian, prostate*** and other cancers.
- Cowden Syndrome – PTEN gene- ***breast, thyroid, uterine*** and other cancers. ***Benign growths*** on the skin and in the mouth.
- Li-Fraumeni Syndrome – p53 gene- ***breast cancer, brain tumors, sarcoma***, ***leukemia, adrenal cortical tumors*** and others. Many of the tumors appear in childhood. Breast cancer is often diagnosed at a very young age – 20's, 30's.
- Peutz-Jegher – STK11 gene – ***gastrointestinal tumors and cancers***, ***black freckling on the lips and inside the mouth, breast cancer.***
- Hereditary Nonpolyposis Colorectal Cancer (HNPCC)– MLH1, MSH2, MSH6, PMS1, PMS2 genes – an inherited risk for ***colon*** and ***uterine*** cancer with a possible small increased risk for ***breast*** cancer. Also an increased risk for ***ovarian*** cancer.

Can inherited risk for breast cancer come from your father's side of the family?
Yes. The inherited conditions resulting in an increased risk for breast cancer are inherited in an autosomal dominant fashion. Because men do not have much breast tissue, their risk of developing breast cancer is not as high as it is for women. Men can carry a mutation and never develop any type of cancer. If an individual carries a mutation in a gene their children are each at a 50% chance of inheriting the same mutation.

What does genetic counseling involve?
The genetic counselor will first obtain your personal and family medical history, focusing on cancer and tumors. The genetic counselor will:

- Determine if cancer in your family has an inherited risk,
- Decide if genetic testing is appropriate and which gene(s) mutations are most likely to be associated with the pattern of cancers in your family.
- Educate you about the pros and cons of genetic testing and provide you with information to assist you in making an informed decision about genetic testing.
- Coordinate genetic testing.
- Refer you to other resources such as other health professionals, books, websites, laws that may protect you from insurance discrimination, etc.

Does a negative test result mean that the family does not have an inherited risk for breast cancer?
Not necessarily. If a mutation has not been identified in another family member, a negative test result does not mean the family is not at increased risk for breast cancer. Only when a mutation has been identified in the family, a negative test result in another family member most likely means that that particular individual is not at increased risk for breast cancer. They would still be at least at the average risk, which is a 11% lifetime risk.

Does a positive test result mean that the person tested will definitely get cancer?
No. Although the risk for breast cancer may be as high as 56-85%, there are some women who have a mutation that will never develop breast cancer.

If an individual tests positive for a mutation does that mean that all other family members affected with breast or related cancers also carry the same mutation?
Not necessarily. Breast cancer is a common cancer in women. There may be some family members that do not carry the mutation and still may develop breast cancer for other reasons.

Should everyone with inherited risk for breast cancer undergo genetic testing?
Undergoing genetic testing is a personal decision. Genetic information may be beneficial to some and harmful to others. Some individuals undergo genetic testing to help them make informed medical decisions (such as prophylactic surgery) and/or to provide information that may be helpful to other family members. Genetic testing can impact the entire family. Before undergoing genetic testing, think about the following questions:

- How will the test result change my medical management, reproductive decision-making or lifestyle?
- How will genetic testing impact other family members? How will it affect my relationship with those family members?
- Am I emotionally ready to undergo genetic testing? Do I have a need to know information or will the information just add stress and not help me much?

What type of health professionals can assist individuals considering genetic testing?
Individuals considering genetic testing, may want to see a genetic counselor to help them make an informed decision. In Colorado there are 5 genetic counseling centers specializing in predisposition to cancer. They are Lisa Mullineaux at Rocky Mountain Cancer Centers; Lisen Axell and Kristina Markey at the University of Colorado Hospital, Breast Center; Teresa Castellano at Porter Hospital; Jeff Shaw at Penrose Hospital in Colorado Springs and Michelle Moore and Elena Strait at Memorial Hospital in Colorado Springs. To find a genetic counselor elsewhere in the country call 1-800-4CANCER.

BREASTWATCH

A COOPERATIVE CLINICAL RESEARCH PROGRAM

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Questions, Comments, Suggestions. . . .

If you have any questions, comments or suggestions regarding this publication, please contact Becky Meinecke at 303-370-7924 or by email at becky.meinecke@colostate.edu

http://breastwatch.colostate.edu

If you are interested in supporting Breast Cancer Prevention research...

Donations towards our research activities would be welcome.
Please send a check made payable to:
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