

High levels of estrogen associated with breast cancer recurrence

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Women whose breast cancer came back after treatment had almost twice as much estrogen in their blood than did women who remained cancer-free – despite treatment with anti-estrogen drugs in a majority of the women –according to researchers in a study published in the March issue of *Cancer Epidemiology, Biomarkers and Prevention*, a journal of the American Association for Cancer Research.

The findings suggest that high levels of estrogen contribute to an increased risk of cancer recurrence, just as they lead to the initial development of breast cancer, said the study's lead author, Cheryl L. Rock, Ph.D., a professor in the Department of Family and Preventive Medicine at the University of California, San Diego.

“While this makes sense, there have been only a few small studies that have looked at the link between sex hormones in the blood and cancer recurrence,” she said. “This is the largest study to date and the only one to have included women taking agents such as tamoxifen to reduce estrogen's effect on cancer growth.

“What the results mean for women who have already been treated for breast cancer is that they should do as much as they can to reduce estrogen in their blood, such as exercising frequently and keeping weight down,” she added. “Taking anti-estrogen drugs like tamoxifen may not completely wipe out the hormone's effect in women who have high levels of estrogen.”

Participants from this study were drawn from the larger Women's Healthy Eating and Living Study (WHEL), a dietary intervention trial that followed 3,088 women who had been treated for early stage breast cancer but who were cancer-free at the time they enrolled. Participants were randomly assigned to one of two groups – one that ate a “normal” healthy diet and the other that ate extremely high amounts of fruits, fiber, and vegetables – and were followed for more than seven years. Breast cancer recurrence was about the same in each group, according to the results, published in 2007. Researchers interpreted the findings to mean that a normal diet that incorporates the U.S. Food and Drug Administration guidelines for recommended amounts of fruits and vegetables is sufficient.

In the current nested case-control study, 153 WHEL participants whose cancer had recurred were matched with 153 participants who remained cancer-free. These pairs were alike in terms of tumor type, body size, age, ethnicity, use of chemotherapy and other variables. Two-thirds of the participants were using tamoxifen, Rock said.

When they enrolled, researchers tested the women's blood for concentrations of the steroid hormones estradiol (the primary human estrogen) and testosterone. They analyzed different forms of estradiol and testosterone in the blood, such as how much was bound to transport proteins (such as to the sex hormone binding globulin, or SHBG) and how much was “free” circulating and able to enter a cell.

Researchers found that higher estradiol concentrations, in all forms, significantly predicted cancer recurrence. Overall, women whose cancer came back had an average total estradiol concentration that was more than double the average for women who remained cancer-free. Increased levels of testosterone or SHBG levels were not associated with recurrence, contradicting the findings of several previous studies.

Although genetic and metabolic factors likely influence the relationship between circulating sex hormones and risk of breast cancer recurrence, Rock said the study provides solid evidence that higher concentrations of estradiol in the blood contribute to risk for breast cancer recurrence.

Source: American Association for Cancer Research

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