A Link Between Environment and Breast Cancer?

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Recent studies on a cluster of breast cancer cases on Long Island indicate that there is no significant link between environmental conditions and the disease. But Bay Area activists, who are concerned because of high rates of breast cancer in Marin County, and scientists agree that the results from these studies are not definitive.

The Long Island Breast Cancer Study Project is one of the largest, most comprehensive studies looking at both organochlorines, which are mainly pesticides (including DDT), and polycyclic aromatic hydrocarbons, or PAHs, which are caused by diesel fuel combustion, cigarette smoking, and other kinds of fire. Of the 12 studies underway, the first two were published in the August volume of Cancer Epidemiology, Biomarkers & Prevention, a journal published by the American Association for Cancer Research. The rest of the findings from this effort, co-sponsored by the National Cancer Institute and the National Institute of Environmental Health Sciences, will be released in a few years.

The study did not find relationships between organochlorines, pesticides, and PCBs to breast cancer. Marilie Gammon, an associate professor of epidemiology at the University of North Carolina and the principal investigator for the Long Island study, said that the results confirmed other studies that have shown more definitively that organochlorines have no connection to the disease.

The researchers found a small positive correlation between exposure to high levels of PAHs and a slight increase in the risk of getting breast cancer, but they have emphasized that the increase is "modest." For example, cigarette smoking is known to increase the risk of lung cancer by 900 to 1000 percent (9 or 10 times), and its mechanisms are clearer. For PAHs in association with breast cancer, they found only a 50 percent risk increase, which is a much smaller magnitude in comparison to that of cigarette smoking and lung cancer.

But, Gammon said, it is not clear whether PAHs contribute to breast cancer. "Because so few people have studied it, it's unclear what our results mean," said Gammon. "It's provocative, and more research needs to be done on it to clarify whether it's a true association or not."

Gammon said that in particular, more large studies are needed to look at the possible connection between environmental factors and breast cancer. Prior to this study, research results have been based on very small numbers of women, from 10, to 17, to 99 individuals in other publications. The study by Gammon and her colleagues enrolled more than 3,000 women, including about 1,500 women diagnosed with cancer, living in Nassau and Suffolk counties.

“Many of the risk factors that we know for breast cancer,” Gammon said, “are a lot of reproductive patterns.” A woman’s age at childbearing and her number of children also affect breast cancer risk, possibly more than PAH exposure.

One in 25 women in the United States will die of breast cancer, according to the National Institutes of Health. “Even a ‘modest’ increase in risk of such a common cancer represents a significant number of women who will face breast cancer,” said Jeanne Rizzo, the executive director of the Breast Cancer Fund, an organization that identifies and advocates for elimination of toxins in the environment that the group believes are contributing to breast cancer. “While many label this increased risk as ‘modest,’ I call this an unacceptable risk,” Rizzo said of the 50 percent increased risk with high PAH exposure, estimated in the Long Island study.

Janice Barlow, the executive director of Marin Breast Cancer Watch, said that focusing research on breast cancer and environmental factors is beneficial. If something in the environment is contributing to breast cancer, she said, potentially people can modify it.

“If you look at the traditional risk factors, reproductive risk factors are associated with breast cancer, such as having your children late, having less children, and having a family history.” Barlow said. “All of those traditional factors only explain between 30 and 50 percent of cases of breast cancer, which means there is anywhere from 50 to 70 percent of cases where there is no known risk factor.”

A paper published in the journal Breast Cancer Research in July, of which Barlow was a coauthor, showed that Marin has very high rates of breast cancer in comparison to other California counties. Non-Hispanic white women aged 45 to 64 had an almost 7 percent higher chance of having the disease than anywhere else in the state. In the last five years, about one woman in 200 had breast cancer in Marin County, compared to approximately 3 in 1,000 in other California counties.

In a position paper that summarizes past research on environmental links to breast cancer, the Breast Cancer Fund and Breast Cancer Action, two organizations that are based in San Francisco, looked at studies of communities with hazardous waste sites and contaminated groundwater. They wrote that researchers consistently found higher rates of death from breast cancer in 339 counties in the United States with those sites in comparison to those counties without them. Both groups have called for new rules to restrict the use of certain chemicals.

Advocates and scientists concerned with this issue feel that more research is needed on this topic, but Gammon said, investigators and studies are lacking. “There are many things that we didn’t study,” she said, “mainly because we don’t have a good way of measuring those particular chemicals in the human body.” One possibility Gammon and her coworkers are exploring is whether an interaction occurs between the metabolization of PAHs and the genes that are responsible for metabolizing these carcinogens.

“It’s frustrating, it’s hard and it’s a very difficult subject,” she said, and one that will take many more years to decipher.

RESOURCES

Long Island Breast Cancer Study Project: http://cancer.gov/cancerinfo/LIBCSP

The Northern California Cancer Center has data on Marin: www.nccc.org

For other local organizations and further information, contact the Breast Cancer Fund: www.breastcancerfund.org (or call 415-346-8223) and Breast Cancer Action: www.bcaction.org (or call 415-243-9301 or 877-2STOPBC).