

Rachel's Environment & Health News

#573 - The Truth About Breast Cancer -- Part 3

November 19, 1997

As we saw in Part 1 of this series (REHW #571), perhaps 30% (a few say as much as 50%) of breast cancer can be explained by genetic inheritance or by factors in a woman's life that increase her exposure to natural estrogens in the blood stream (female sex hormones). Genetic inheritance accounts for an estimated 5% to 10% of the total.[1]

The evidence implicating natural estrogen is pretty convincing. If a woman starts having her period early in life or goes through menopause late, her chances of getting breast cancer are increased. Not having a baby at all, or having the first baby late in life, increases the likelihood of breast cancer. Having more babies is more protective against breast cancer --having more than 5 is most protective.[2] Breast feeding seems to be protective (though it is unclear exactly why). Having one's ovaries surgically removed is VERY protective; in pre-menopausal women, the ovaries are the major source of natural estrogen. In sum, for unknown reasons, under some circumstances, prolonged exposure to natural estrogen increases the likelihood of breast cancer in some women.[1]

Still, 50% to 70% (or more) of breast cancers remain unexplained. And consider this: Compared to their grandmothers, more of the current generation of women in their '50s had children, and they had their children earlier --both factors that should have reduced this generation's breast cancer risk. Yet this generation's incidence of breast cancer has been steadily increasing.[3] Clearly something else is overwhelming these protective reproduction-related "risk factors."

The "something else" is no doubt a combination of other factors including medical irradiation,[4] exposures to cancer-causing or cancer-promoting chemicals (including alcohol, cigarette smoke,[5] pharmaceuticals, pesticides, food additives such as partially hydrogenated vegetable oils,[6,7] and other industrial compounds), lack of exercise, obesity (especially among women who were thin at age 18 and seriously overweight after menopause[8]) and perhaps other (as yet unknown) factors. Most likely these various factors work together, along with natural estrogen. Furthermore, many people probably inherit a susceptibility to particular harms --for example, some people have a poorly-developed mechanism for detoxifying chemicals that they ingest. For those people, ingesting chemicals may be more dangerous than it is for other people. Thus, genetic inheritance and environmental exposures no doubt interact in complex ways to cause breast cancer and other cancers as well.

What's hopeful is this: we can't change out genetic inheritance, but we can clean up the environment and reduce exposures to known carcinogens. But first, of course, we would need to identify them. There are about 75,000 different chemicals now in use and only 1200 to 1500 of these have been tested for carcinogenicity.[9] No one knows how many of the 75,000 contribute to cancer in humans but a recent estimate concluded that we should expect 5% to 10% of these (3750 to 7500 different chemicals) to be carcinogenic in humans.[10] Currently, our government regulates fewer than 200 chemicals on the basis of their carcinogenicity. We have a way to go yet --and we add roughly 2000 new, untested chemicals into commercial use each year now. Yes, we have a way to go.

Medical irradiation is the most-firmly-established of all causes of breast cancer. At least 32 positive studies have shown that irradiating the female breast increases the likelihood of breast cancer.[11] (In the case of mammography, after age 50 the benefits pretty clearly outweigh the risks, but if you are younger than 50, read up on the subject before you decide. In any case, please don't take our word on this --consult a qualified physician.)

Dr. John Gofman (a physician and radiation specialist) has argued in elaborate detail that medical irradiation --IN CONJUNCTION WITH OTHER CO-FACTORS --has played a role in 65% to 75% of today's breast cancers. [11] (See REHW #443.) The latest edition of Gofman's book makes it clear that the problem of excessive radiation of girls' and women's breasts is NOT a thing of the past.

Anyone who wants to learn how to prevent breast cancer needs to know what Gofman is talking about so that they can protect themselves and their loved ones from excessive medical irradiation. (See Gofman's chapter 48, pgs. 353-372).

In recent years, attention has focused on chemicals that can disrupt the hormone system. Often these chemicals mimic or block estrogen. Therefore, because breast cancer seems to be intimately associated with estrogen, it seems a reasonable question ask: are industrial chemicals that disrupt hormones contributing to breast cancer? As we have seen (REHW #571, #572), this is a question that the chemical industry is not comfortable asking.

Is it plausible that organochlorines could interfere with human hormones? Some people think it is. Some say not, arguing that organochlorines are 100 to 10,000 times less potent than natural hormones. On the other hand, organochlorines are present in human blood at levels 40 to 250 times as high as natural hormones.[12] Furthermore, only 1% to 3% of natural hormones are biologically active (and sometimes much less than 1% is active) --the remaining 97% to 99% (or more) is bound by proteins and is unavailable to the body's hormone receptors.[13] Organochlorines are not necessarily bound in this way. Lastly, natural hormones last only a short time; most have a half-life of less than 30 minutes in the blood.[14] Many organochlorines have half-lives measured in years. Therefore, the arithmetic begins to put organochlorines into the ballpark where they might compete with --and interfere with --natural hormones.

Here we will begin to review some of the evidence indicating (in some cases, NOT indicating) that exposure to certain chemicals can increase a woman's chances of getting breast cancer. No one has suggested that chemical exposures explain ALL unexplained breast cancers. Still, if 50% to 70% of breast cancers are unexplained, that means 91,000 to 127,000 new cases of breast cancer go unexplained each year. If chemical exposures accounted for just 10% to 20% of those cancers, then we would have the key to preventing between 9,000 and 25,000 cases of breast cancer each year. The possibility seems too important to ignore.

Here is some of the evidence:

** Breathing vinyl chloride fumes causes breast cancer in female rats, even at low doses.[15]

** Likewise, a study of women who breathe vinyl chloride fumes on the job showed a 36% increase in breast cancer deaths.[15]

** Some pharmaceutical preparations are associated with increased likelihood of breast cancer. For example, a study of 501,536 women who received diethylstilbestrol (DES) --a synthetic estrogen --revealed a 34% increased likelihood of getting breast cancer.[16]

** Reportedly, 85% of pharmaceutical drugs involve chlorinated chemicals in their manufacture.[17] A 1979 study by the National Cancer Institute revealed excessive breast cancer (22 observed, 12.3 expected) among 1075 white women employed in pharmaceutical manufacture.[18]

** A study in New Jersey revealed excessive breast cancer among African American female pharmaceutical workers, chemical workers, electrical equipment workers, and printing plant workers (the latter two industries being associated with exposures to chlorinated solvents). [19]

A New York state study of white women in the electrical equipment and printing industries (again, presumably exposed to chlorinated solvents) showed elevated rates of breast cancer.[20]

** Women employed for more than 5 years as beauticians have a three-fold increased likelihood of getting breast cancer.[21]

** Breast cancer is increased in 339 U.S. counties that have hazardous waste sites and groundwater contamination compared to counties without such sites. In this study of waste dumps and cancers (during 1970-1979) in U.S. counties, breast cancer was the most elevated cancer among women.[22]

** Fishermen's wives who eat organochlorine-contaminated fish from the Baltic sea (east coast of Sweden) have an elevated incidence of breast cancer compared to women eating less-contaminated fish from the west coast of Sweden.[23] Among the group of 2175 women, 38 cancers were expected and 49 were observed.

** Women occupationally exposed to trichlorophenol, 2,4,5-T (the herbicide that formed one-half of Agent Orange in Vietnam) and dioxin had an elevated incidence of breast cancer (9 observed vs. 4.2 expected) [24] even though dioxin is usually considered an anti-estrogen that may sometimes protect against estrogen-related cancers.

[To be continued.]

--Peter Montague (National Writers Union, UAW Local 1981/AFL-CIO)

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[1] Jennifer L. Kelsey and Leslie Bernstein, "Epidemiology and Prevention of Breast Cancer," ANNUAL REVIEW OF PUBLIC HEALTH Vol. 17 (1996), pgs. 47-67.

[2] Jennifer L. Kelsey and others, "Reproductive and Hormonal Risk Factors," EPIDEMIOLOGIC REVIEWS Vol. 15, No. 1 (1993), pgs. 36-47.

[3] Robert A. Hahn and others, "Nulliparity, Decade of First Birth, and Breast Cancer in Connecticut Cohorts, 1855 to 1945: An Ecological Study," AMERICAN JOURNAL OF PUBLIC HEALTH Vol. 79, No. 1 (November 1989), pgs. 1503-1507.

[4] Esther M. John and Jennifer L. Kelsey, "Radiation and Other Environmental Exposures and Breast Cancer," EPIDEMIOLOGIC REVIEWS Vol. 15, No. 1 (1993), pgs. 157-162.

[5] Alfredo Morabia and others, "Relation of Breast Cancer with Passive and Active Exposure to Tobacco Smoke," AMERICAN JOURNAL OF EPIDEMIOLOGY Vol. 143, No. 9 (1996), pgs. 918-928.

[6] Lenore Kohlmeier and others, "Adipose Tissue TRANS Fatty Acids and Breast Cancer in the European Community Multicenter Study on Antioxidants, Myocardial Infarction, and Breast Cancer," CANCER EPIDEMIOLOGY, BIOMARKERS & PREVENTION Vol. 6 (September 1997), pgs. 705-710.

[7] Z.Y. Chen and others, "Similar distribution of TRANS fatty acid isomers in partially hydrogenated vegetable oils and adipose tissue of Canadians," CANADIAN JOURNAL OF PHYSIOLOGY AND PHARMACOLOGY Vol. 73 (1995), pgs. 718-723.

[8] Zhiping Huang and others, "Dual Effects of Weight and Weight Gain on Breast Cancer Risk," JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION Vol. 278, No. 17 (November 5, 1997), pgs. 1407-1411.

[9] Sandra Steingraber, LIVING DOWNSTREAM (N.Y.: Addison-Wesley, 1997), pg. 99, citing a 1984 estimate by the National Academy of Sciences and a 1997 estimate provided by an official of U.S. Environmental Protection Agency.

[10] Victor A. Fung and others, "The Carcinogenesis Bioassay in perspective: Application in Identifying Human Cancer Hazards," ENVIRONMENTAL HEALTH PERSPECTIVES Vol. 103, Number 7-8 (July-August 1995), pgs. 680-683.

[11] John W. Gofman, PREVENTING BREAST CANCER: THE STORY OF A MAJOR, PROVEN, PREVENTABLE CAUSE OF THIS DISEASE [Second Edition] (San Francisco: Committee for Nuclear Responsibility, 1996). Available for \$17.00 from Committee for Nuclear Responsibility, P.O. Box 421993, San Francisco, CA 94142. His discussion of co-factors appears on pages 350-351. The 32 positive studies linking radiation to breast cancer are highlighted with a sharp sign (#) in Gofman's bibliography, pgs. 383-402.

[12] Larry G. Hansen and Heiko T. Jansen, "[Letter]," SCIENCE Vol. 266 (October 28, 1994), pg. 526.

[13] David V. Schapira and others, "Obesity, Body Fat Distribution, and Sex Hormones in Breast Cancer Patients," CANCER Vol. 67, No. 8 (April 15, 1991), pgs. 2215-2218.

[14] H. Maurice Goodman, BASIC MEDICAL ENDOCRINOLOGY [Second Edition] (New York: Raven Press, 1994), pg. 8.

[15] Sandra Steingraber, "Mechanisms, Proof, and Unmet Needs: The Perspective of a Cancer Activist," ENVIRONMENTAL HEALTH PERSPECTIVES Vol. 105, Supplement 3 (April, 1997), pgs. 685-687, citing P.F. Infante and others, "A historical perspective on some occupationally related diseases of women," JOURNAL OF OCCUPATIONAL MEDICINE Vol. 36 (1994), pgs. 826-831, and L. Chiazzese and others, "Mortality among employees in PVC fabricators," JOURNAL OF OCCUPATIONAL MEDICINE Vol. 19 (1977), pgs. 623-628.

[16] E.E. Calle, "Diethylstilbestrol and risk of fatal breast cancer in a prospective cohort of U.S. women," AMERICAN JOURNAL OF EPIDEMIOLOGY Vol. 144, No. 7 (October 1, 1996), pgs. 645-652.

[17] Ferdinand Engelbeen, personal communication, November 16, 1997. Englebeen is chairman of a group called Chlorophiles who say they represent workers in the chlorine and PVC industries "who want to react to the allegations made against the products they make with responsible care for the benefit of mankind." Their web site can be seen at <http://www.ping.be/chlorophiles/>. E-mail: Ferdinand.Engelbeen@ping.de.

[18] T.L. Thomas and P. Decoufle, "Mortality among Workers Employed in the Pharmaceutical Industry: A Preliminary Investigation," JOURNAL OF OCCUPATIONAL MEDICINE Vol. 21, No. 9 (September 1979), pgs. 619-623.

[19] Nancy E.L. Hall and Kenneth D. Rosenman, "Cancer by Industry: Analysis of a Population-Based Cancer Registry With an Emphasis on Blue-Collar Workers," AMERICAN JOURNAL OF INDUSTRIAL MEDICINE Vol. 19 (1991), pgs. 145-159.

[20] Hall and Rosenman, cited above, citing P.A. MacCubbin and others, MORTALITY IN NEW YORK STATE, 1980-1982: A REPORT BY OCCUPATION AND INDUSTRY [Monograph No. 21] (Albany, N.Y.: New York Department of Health, 1986).

[21] K.L. Koenig and others, "Hair dye use and breast cancer: a case-control study among screening participants," AMERICAN JOURNAL OF EPIDEMIOLOGY Vol. 133, No. 10 (May 15, 1991), pgs. 985-995.

[22] Jack Griffith and Wilson B. Riggan, "Cancer Mortality in U.S.

Counties with Hazardous Waste Sites and Ground Water Pollution," ARCHIVES OF ENVIRONMENTAL HEALTH Vol. 44, No. 2 (March/April 1989), pgs. 69-74.

[23] Lars Rylander and Lars Hagmar, "Mortality and cancer incidence among women with a high consumption of fatty fish contaminated with persistent organochlorine compounds," SCANDINAVIAN JOURNAL OF WORK, ENVIRONMENT AND HEALTH Vol. 21, No. 6 (1995), pgs. 419-426.

[24] A. Manz and others, "Cancer mortality among workers in a chemical plant contaminated with dioxin," THE LANCET Vol. 338, No. 8773 (October 19, 1991), pgs. 959-964.

Descriptor terms: breast cancer; carcinogens; radiation; tobacco; cigarettes; exercise; genes; estrogen; pharmaceuticals; pesticides; food additives; trans fatty acids; partially hydrogenated vegetable oils; obesity; vinyl chloride; des; hazardous waste landfills and cancer; pharmaceutical workers; electrical workers; chemical workers; printing plant workers; occupational safety and health; dioxin; 2,4,5- t; trichlorophenol; food safety;