

# Rachel's Environment & Health News

## #562 - The Causes Of Lymph Cancers

September 03, 1997

Non-Hodgkin's lymphoma (NHL) is a group of cancers that arise in the white blood cells. NHL is increasing rapidly in the U.S. and elsewhere in the industrialized world. In the year 1950, 5.9 Americans per 100,000 were diagnosed with non-Hodgkin's lymphoma. In 1985, the incidence (occurrence) rate of this disease had risen to 13.1 per 100,000.[1] By 1991, the incidence rate had reached 15.1 per 100,000 and was still climbing.[2]

Between 1973 and 1991, the incidence of non-Hodgkin's lymphoma increased at the rate of 3.3% per year, making it the third fastest-growing cancer (after prostate cancer, growing at 3.9% per year, and melanoma of the skin, also growing at 3.9% per year).[2] In recent years, AIDS patients have contributed to the increase in NHL, but a steady rise in the incidence of this disease was apparent long before the AIDS epidemic. Together the known "risk factors" for NHL -- including immune-suppressing drugs, rare immune-system diseases, and AIDS, explain only a small proportion of NHL cases.

About 50,900 new cases of NHL were diagnosed in the U.S. in 1995 and about 22,700 deaths from NHL were reported that year.[3] NHL is a serious disease; half the people diagnosed with it are dead within five years. The causes of NHL are not understood, but the following factors have been implicated in many studies:

\*\* Phenoxy herbicides, especially 2,4,5-T (the herbicide now banned in the U.S.) and 2,4-D, the most popular chemical killer of dandelions and crabgrass in lawns.[4] More than a dozen studies now indicate that exposure to these herbicides increases the likelihood of getting NHL.

\*\* Viruses. The roles of viruses "appears to be minor," say Paul Scherr and Nancy Mueller, who are experts in the viral causes of cancer. However, the Epstein Barr virus (EBV) seems to be implicated in some way in many cases of non-Hodgkin's lymphoma, although the virus BY ITSELF does not seem to cause the disease.[1,5]

\*\* People with compromised immune systems and/or autoimmune diseases have a substantially increased likelihood of getting NHL. This is a consistent thread running throughout NHL research: the NHL family of cancers tends to strike people whose immune systems are degraded for one reason or another. This was first discovered among people who had had organ transplants. The body's immune system naturally tries to reject foreign organs. To allow a foreign kidney or liver to be accepted, doctors devised medications to suppress the immune system. In some instances, suppressing the immune system gave rise to NHL. Since that time, researchers have documented many different ways in which suppressed or malfunctioning immune systems allow NHL to develop.

In the authoritative reference book, *CANCER EPIDEMIOLOGY AND PREVENTION*, Paul Scherr and Nancy Mueller conclude[1] that there are two clear threads visible in NHL research:

1. People whose immune systems are continually challenged (for example, by medications or by autoimmune diseases such as rheumatoid arthritis, or by other factors) seem to lose control of latent cancer-causing infections that may be caused by viruses such as the Epstein Barr virus.

2. "Another group who appears to be at increased risk are individuals with occupational exposures to chemicals," say Scherr and Mueller. They continue, "There is mounting evidence implicating phenoxy herbicide exposures, although the evidence is still not conclusive." [1]

Scherr and Mueller do not say so, but there is also evidence that the likelihood of NHL is increased by exposure to DDT, the well-known organochlorine pesticide.[6] In addition, recent evidence suggests that another class of pesticides --the organophosphates such as malathion and parathion --can cause NHL.[7] Thus

organochlorines, organophosphates, and phenoxy herbicides are now all implicated in the mushrooming problem of NHL.

Most recently, provocative new research indicates that PCBs, too, can cause non-Hodgkin's lymphoma. From 1929 until just recently, PCBs were used in electrical equipment as fire retardants. They were also used in plastics, preservatives, varnishes, waxes, and carbonless carbon paper.

The connection between PCBs and NHL was first suggested in 1996 by the Swedish researcher, Lennart Hardell.[8] Hardell studied a small group (28 individuals) with NHL and compared them to a control group of 17 surgical patients in the same Swedish hospital who did not have cancer. Hardell took tissue samples from both groups and analyzed them for DDT and its breakdown product, DDE; dioxins; hexachlorobenzene (HCB); and PCBs. The tissue concentrations of both groups were the same for DDT, DDE, HCB and dioxins. However, when it came to PCBs, the group with NHL has significantly[9] more PCBs in their tissues than the control group did.

This finding is biologically plausible because PCBs are known to suppress the immune system of animals and humans. Hardell concluded his research report in 1996 saying, "Immunological impairments have been shown after exposure to PCBs. Since immunosuppression is an established risk factor for NHL, our results are of interest in the etiology [causation] of NHL but need to be confirmed in larger studies."

Now a larger study by the National Cancer Institute (NCI) has confirmed Hardell's results.[10] NCI researchers set out to explore whether people with NHL had more than their fair share of DDT in their tissues. They examined blood that had been taken from nearly 26,000 healthy individuals in 1974 --a prospective study known as the Campaign Against Cancer and Stroke [or CLUE I] being conducted at Johns Hopkins University in Baltimore. Within the large group, they identified 74 individuals who had eventually contracted NHL, and they matched them against 147 controls who did not have NHL.

The NCI researchers did not find any connection between DDT and NHL but, quite unexpectedly, they found a 4.5-fold increase in non-Hodgkin's lymphomas among people who had 1050 parts per billion (ppb) of PCBs in the fat globules of their blood, compared to people who had only 250 to 650 ppb PCBs. The study found a clear dose-response relationship between PCBs in the blood and the likelihood of having NHL.

Furthermore, this NCI study provided additional evidence of the role of the Epstein Barr virus in NHL. Individually, PCBs and EBV each increased the likelihood of NHL. However, together, the presence of BOTH Epstein Barr virus AND elevated PCBs in individuals had a synergistic effect, combining to produce a 22-fold increase in the likelihood of NHL.

The solution to this problem has two parts. One part involves the use of pesticides. Organochlorines, organophosphates, and phenoxy herbicides all increase the dangers of NHL. In the case of these chemicals, it is not too late to make sensible, precautionary decisions. In our homes, our public buildings, our schools, and our businesses we could avoid these products like the plague. Alternative ways of dealing with pests are well-known. If pesticides are needed at all, they are needed only in emergencies.

The second part of the problem is PCBs. Some 3.4 billion pounds of PCBs were distributed into the environment --all of them manufactured or licensed for manufacture by one corporation, Monsanto of St. Louis, Missouri.[11]

The whereabouts of 30 percent of all PCBs (roughly a billion pounds) remains unknown. Another 30 percent resides in landfills, in storage, or in the sediments of lakes, rivers, and estuaries. Some

30 percent to 60 percent remains in use. The characteristics of PCBs (their stability and their solubility in fat) tend to move them into the oceans as time passes. There they decimate wildlife. It is estimated that only one percent of all PCBs have, so far, reached the oceans.

Without major efforts to locate, capture, and destroy the one-to-two billion pounds of PCBs that are "out there," future generations will continue to be poisoned by PCBs, at great social and individual cost.

Recently, we hear a drum beat of public relations from Monsanto, claiming that it has turned over a new leaf and is now committed to behaving in a civilized fashion. If this is so, Monsanto could demonstrate its awakening by leading a global effort to locate and destroy PCBs, cleansing the planet (to the extent possible) of this brain-damaging, immune-suppressing, cancer-causing substance. Has anyone seen a sign of serious intentions from St. Louis?  
--Peter Montague (National Writers Union, UAW Local 1981/AFL-CIO)

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[1] Paul A. Scherr and Nancy E. Mueller, "Non-Hodgkin's lymphomas," in David Schottenfeld and Joseph F. Fraumeni, Jr., editors, *CANCER EPIDEMIOLOGY AND PREVENTION* (New York: Oxford University Press, 1996), pgs. 920-945.

[2] Angela Harras and others, editors, *CANCER RATES AND RISKS 4TH EDITION* [NIH Publication No. 96-691] (Bethesda, Maryland: National Cancer Institute, 1996), pg. 17.

[3] C.L. Kosary and others, editors, *SEER CANCER STATISTICS REVIEW 1973-1992* [National Institutes of Health Publication No. 96-2789] (Bethesda, Md.: National Cancer Institute, 1995), Table I-1, pg. 15.

[4] For example, see Shelia Hoar Zahm and others, "A Case-Control Study of Non-Hodgkin's Lymphoma and the Herbicide 2,4-Dichlorophenoxyacetic Acid (2,4-D) in Eastern Nebraska," *EPIDEMIOLOGY* Vol. 1, No. 5 (September 1990), pgs. 349-356. And: Donald T. Wigle and others, "Mortality Study of Canadian Male Farm Operators: Non-Hodgkin's Lymphoma Mortality and Agricultural Practices in Saskatchewan," *JOURNAL OF THE NATIONAL CANCER INSTITUTE* Vol. 82, No. 7 (April 4, 1990), pgs. 575-582. The earliest report came from Lennart Hardell, "Malignant lymphoma of histiocytic type and exposure to phenoxyacetic acids or chlorophenols," *LANCET* Vol. 1, No. 8106 (January 6, 1979), pgs. 55-56. Numerous other relevant studies are reviewed and cited in Paul A. Scherr and Nancy E. Mueller, "Non-Hodgkin's lymphomas," in David Schottenfeld and Joseph F. Fraumeni, Jr., editors, *CANCER EPIDEMIOLOGY AND PREVENTION* (New York: Oxford University Press, 1996), pgs. 920-945, and in Nathaniel Rothman and others, "A nested case-control study of non-Hodgkin lymphoma and serum organochlorine residues," *THE LANCET* Vol. 350 (July 27, 1997), pgs. 240-244.

[5] Nancy E. Mueller and others, "Viruses," in David Schottenfeld and Joseph F. Fraumeni, Jr., editors, *CANCER EPIDEMIOLOGY AND PREVENTION* (New York: Oxford University Press, 1996), pgs. 502-531.

[6] J.S. Woods and others, "Soft tissue sarcoma and non-Hodgkin's lymphoma in relation to phenoxyherbicide and chlorinated phenol exposure in western Washington," *JOURNAL OF THE NATIONAL CANCER INSTITUTE* Vol. 78, No. 5 (May 1987), pgs. 899-910. And: K.P. Cantor and others, "Pesticides and other agricultural risk factors for non-Hodgkin's lymphoma among men in Iowa and Minnesota," *CANCER RESEARCH* Vol. 52, No. 9 (May 1992), pgs. 2447-2455. And: S.H. Zahm and others, "The role of agricultural pesticide use in the development of non-Hodgkin's lymphoma in women," *ARCHIVES OF ENVIRONMENTAL*

*HEALTH* Vol. 48, No. 5 (September 1993), pgs. 353-358.

[7] Two studies are described briefly in John Wargo, *OUR CHILDREN'S TOXIC LEGACY* (New Haven, Connecticut: Yale University Press, 1996), pg. 237, footnote 13. And see S.H. Zahm and others, "The role of agricultural pesticide use in the development of non-Hodgkin's lymphoma in women," *ARCHIVES OF ENVIRONMENTAL HEALTH* Vol. 48, No. 5 (September 1993), pgs. 353-358, which found a 4-fold increase in NHL among women exposed to organophosphates.

[8] Lennart Hardell and others, "Higher concentrations of specific polychlorinated biphenyl congeners in adipose tissue from non-Hodgkin's lymphoma patients compared with controls without a malignant disease," *INTERNATIONAL JOURNAL OF ONCOLOGY* Vol. 9 (1996), pgs. 603-608.

[9]  $p < 0.06$ .

[10] Nathaniel Rothman and others, "A nested case-control study of non-Hodgkin lymphoma and serum organochlorine residues," *THE LANCET* Vol. 350 (July 26, 1997), pgs. 240-244. And see J. Raloff, "PCBs linked to rise in lymph cancers," *SCIENCE NEWS* Vol. 152 (August 9, 1997), pg. 85.

[11] Carol W. Bason and Theo Colborn, "U.S. Application and Distribution of Pesticides and Industrial Chemicals Capable of Disrupting Endocrine and Immune Systems," in Theo Colborn and Coralie Clement, editors, *CHEMICALLY-INDUCED ALTERATIONS IN SEXUAL AND FUNCTIONAL DEVELOPMENT: THE WILDLIFE/HUMAN CONNECTION* [Advances in Modern Environmental Toxicology Vol. XXI] (Princeton, N.J.: Princeton Scientific Publishing Co., 1992), pgs. 335-345.

#### 4th NATIONAL GRASS-ROOTS CONVENTION OCTOBER 3-5

The CCHW Center for Health, Environment and Justice will sponsor its fourth national grass-roots convention October 3-5 in Arlington, Va., just outside Washington, D.C.

CCHW conventions provide grass-roots activists a chance to celebrate victories, create and renew friendships, develop strategies and learn specific skills for use in local fights. This convention will be an exceptionally good one.

The agenda includes numerous practical workshops on a broad range of subjects like "advanced organizing" and SLAPP suits and how to do research.

In addition, there will be thought-provoking sessions on big-picture topics, such as: sustainable economic development; coalition building; expanding and diversifying the grass-roots movement; "It's the economy, stupid;" and challenging corporate control of our society.

Personally, I wouldn't miss this convention for anything. --Peter Montague

For more details, contact CCHW: P.O. Box 6806, Falls Church, VA 22040; telephone (703) 237-2249.

Descriptor terms: cancer; carcinogens; non-hodgkin's lymphoma; nhl; blood; lymph system; lymphomas; disease statistics; morbidity; mortality; immune system; epstein barr virus; ebv; phenoxy herbicides; viruses; infectious cancer-causing diseases; paul scherr; nancy mueller; organ transplants; rheumatoid arthritis; ddt; dde; organophosphates; malathion; parathion; pcbs; polychlorinated

biphenyls; lennart hardell; monsanto; hcb; hexachlorobenzene;  
2,4,5-T; 2,4-D; synergism; precautionary principle; pesticides;