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Two Deaths Of A Rare Cancer

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Presented at the American Cancer Society's Sixteenth Science Writers' Seminar, St. Augustine Florida, March 22-27, 1974.

Occupational Health Nursing, September 1974

The discovery in recent weeks that unusual cancers were being found among workers who had been employed in chemical plants using vinyl chloride has brought into sharp focus a problem with which many have been increasingly uncomfortable.

Our world is changing and, especially in the past 40 years, the environment in which we live has been altered to an extraordinary extent. The air we breathe contains gases and particles that never before entered the human lung. Our food has chemicals designed to improve its taste, freshness, appearance — but which are strange to our intestines, livers, kidneys, blood. We touch, ingest, inhale, absorb an ever-increasing number of synthetic materials and, in other circumstances, agents which may have existed on earth but were never part of the immediate human environment.

Do such changes threaten us? How do they relate to the estimate (WHO) that approximately 85% of all cancer is derived from environmental sources?

The recent establishment of the Environmental Cancer Research Project by the Board of Directors of the American Cancer Society is meant to directly confront this problem, considered urgent and immediate.

Its urgency is derived from:

1. The appreciation that almost all environmental causes of cancer have a long period of clinical

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continued

latency from onset of exposure to evidence of disease. Cancers we are seeing now had their origin 15-35 years ago. And cancer agents being newly introduced into our environment will not show their effect for decades. Prevention of cancer in the year 2000 is the order of the day in 1974.

The thousands of cancer deaths — lung cancer, mesothelioma, C.I. cancer — among asbestos workers in the 1970's are to be traced back to the uncontrolled conditions of the 1930's and 1940's and 1950's.

2. New agents, in modern society, are rapidly broadcast among large numbers of people — millions and tens of millions. Risk is no longer confined to a special mountain area or an esoteric trade. A useful chemical or an efficient plastic soon permeates a nation, or large parts of the world. There is literally no place to hide.
3. There has been, and continues to be, no pretesting of materials for cancer or other serious disease. Examination is for serviceability, salability, utility. Whether cancer will result is hardly considered, except for radioactive devices.

Vinyl Chloride and Polyvinyl Chloride

Dr. John L. Creech, plant physician of the B. F. Goodrich Company in Louisville, Kentucky, learned toward the end of last year that an employee of the company (vinyl chloride-polyvinyl chloride plant) died in March 1973 of a rare tumor, angiosarcoma of the liver. This prompted him to review the records of another former employee and patient who had died in 1971 — and he found that the cause of death here, too, was angiosarcoma of the liver.

These two cases have alerted us to what may turn out to be a widespread cancer hazard, and the problem they present epitomizes the complexity of the situation we face. The sequence of events has been as follows:

1. The tumors have been confirmed. The public announcement of the finding by the company on January 23, 1974, led to search for other such tumors among vinyl chloride workers. By March 1st, the Louisville plant (fewer than 300 vinyl workers) knew of seven cases from among its workforce. Other cases were soon discovered in other plants in New York, Texas, West Virginia, and elsewhere. Dr. Hans Popper and Dr. Lewis Thomas at the N.I.H. reviewed the pathological material and verified the diagnosis.
2. The rarity of the tumor has also been substantiated. In 52,000 autopsies at the Los Angeles County Hospital, for example, only one case had been seen.
3. The tumor has been rare in the general public but not necessarily with vinyl exposure. The cases seen had begun work from 12 to 27 years before diagnosis of the invariably fatal tumor. The industry then had few workers — perhaps 1,000 or thereabouts — and most of these men are still alive. The cases found, then, represent a significant percentage of those who've

died of all causes. This new occupational cancer promises to be an important cause of death among vinyl workers.

4. Although vinyl chloride has had a number of uses — as a propellant in pressurized cans of consumer products, for example — its most important is as the base ingredient for the manufacture (polymerization) of polyvinyl chloride — the widely used "vinyl" plastic. And it is realized that some (often 1-3 percent) unpolymerized vinyl chloride (monomer) is residual in the polyvinyl end product.
5. How far out into the community does vinyl chloride exposure extend? This is an immediate question before us, as is its essential corollary: Will this exposure also be associated with disease? Will the fate of the vinyl workers spread to the users of the product?
 - Will workers in thousands of secondary factories using PVC extending, molding, mixing — have significant exposures?
 - Will families of workers be affected by fragments of material brought home by workers on their clothes and shoes?
 - Will consumer products containing traces of vinyl chloride be associated with difficulties?

There is no evidence at present that disease will occur in such circumstances, since the questions have only now been raised. Obviously the answers must be sought as rapidly as possible.

E.C.R.P. Seeking Answers

The Environmental Cancer Research Project is seeking these answers in an urgent wide-ranging program, begun January 25th.

1. Its epidemiological unit at the ACS has analyzed its records of 75,000 deaths in its Cancer Prevention Study begun in 1959, to seek out those due to angiosarcoma of the liver, to see if some pattern emerges. (One case was found.)
2. Epidemiological studies — retrospective and prospective — have been begun of a large defined population of VC workers in New York State. This will identify all disease among these individuals. We do not know, for example, that liver cancer is the only neoplasm that VC can cause.
3. Its clinical arm (at the Mount Sinai School of Medicine of the City University of New York) has examined virtually the entire group of employed workers at the plant — 401 men were carefully studied March 9-11.
4. Experimental studies are being organized and developed. On March 18, 15 leading toxicologists and other scientists met at the ACS in New York. Dr. Cesare Maltoni of Bologna, Italy, reviewed his current animal studies with them — these demonstrated an extraordinary cancer potential of the chemical experimentally — and plans were set to explore many essential questions.

5. Epidemiological and clinical studies of secondary users are being organized, as among makers of vinyl paints. Field teams are sampling dusts in houses of VC workers. Scientists are tooling up to determine whether there are traces of VC and PVC in our tissues, similar to the contamination found with DDT and PCBs.

6. Resources from many centers and institutions are being brought to bear on the problem. To help focus and coordinate these, key scientists from the U.S., Germany, Rumania, Italy, Great Britain and elsewhere will meet May 10-11 in New York to review what is now known and to consider what should be done. This Working Group is being

arranged, with the ACS, by The New York Academy of Sciences.

All this, however, is reaction. We did not predict the problem. It is sobering to realize that there may be other agents sitting in the wings, from the chemical process or other industries, which we do not now suspect and which we still do not really yet know how to anticipate. "We can't see them but we hear them moving about in the forest."

And it is perhaps even more sobering to appreciate that if the two cancers had not been rare and unusual, Dr. Creech would not have spotted them. Lung cancer and colon cancer could have been increased greatly, for example, and we would still not know.

22nd Annual AAIN Presidents' Meeting

Radisson Hotel

Minneapolis, Minnesota

September 21 & 22, 1974