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16. Abstract (Limit: 200 words) This statement concerned the NIOSH investigation of occupational exposure to dibromochloropropane (96128) (DBCP) and possible reduced sperm counts among workers handling this compound. Due to the concern of one worker, a chemical company, the Oxy Chem facility in Lathrop, California, contacted NIOSH for assistance in determining whether a health problem existed at their facility. Research indicated that there was a problem and resulted in the identification of DBCP as the offending agent. Confirmation was sought by testing workers at other sites involved in the production of this pesticide. Their research supported the findings that DBCP was the agent responsible for the testicular toxicity. Literature studies revealed DBCP to be an animal carcinogen and a relatively potent mutagen as well. A proposed emergency standard for occupational exposure to DBCP was submitted to OSHA in early September of 1977 setting an exposure limit and requiring medical surveillance guidelines. A symposium on DBCP was held so that all interested parties might share available data. All participants agreed to the need for a registry of individuals exposed to DBCP. Research has now spread to the possible reproductive effects of exposure to other chemicals similar in structure to DBCP.

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Statement of

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National Institute for Occupational Safety and Health  
Center for Disease Control  
Department of Health, Education, and Welfare

Before the  
Subcommittee on Agricultural Research and General Legislation  
Senate Committee on Agriculture, Nutrition, and Forestry

December 13, 1977



Mr. Chairman and Members of the Subcommittee:

I am Dr. John F. Finklea, Director of the National Institute for Occupational Safety and Health (NIOSH). Accompanying me today is Dr. Channing R. Meyer, Chief of the Medical Section, Hazard Evaluation and Technical Assistance Branch, charged with investigating toxic hazards in the workplace. We welcome the opportunity to appear before you today to discuss our investigation of occupational exposure to the pesticide dibromochloropropane (DBCP). Dr. Meyer, who is the principal NIOSH investigator in this study, will read our statement.

NIOSH first became aware of the problem of depressed sperm counts at Oxy Chem in Lathrop, California during the early part of July 1977. As a result of a worker's persistence and desire to know if his fertility problems were related to occupational exposure, the entire country has become alerted to this serious problem. Dr. Donald Whorton, Director of the Labor Occupational Health Program at Berkeley, California, was asked by the Oil Chemical and Atomic Workers union, and later the company to evaluate the problem. Following consultation with Dr. Whorton it was apparent that further investigation was necessary. NIOSH was requested by the union, the company and OSHA to perform a health hazard evaluation at Oxy Chem. Since Dr. Whorton had done the initial work and was located in the area, arrangements were made for him to assist us with the hazard evaluation under a medical services contract. Dr. Whorton was the principal medical investigator and NIOSH provided the necessary support needed to carry out the study.

During the early phases of this investigation NIOSH notified OSHA that there seemed to be a significant health problem at the Oxy Chem plant but the causative agent was unknown. NIOSH and other groups searched the

scientific literature in an attempt to identify any chemicals used in the plant that might have reproductive effects. Three agents dibromochloropropane(DBCP), ethylene dibromide (EDB), and carbaryl were reported in the technical literature to cause testicular or sperm abnormalities in experimental animals. DBCP appeared to be the most likely candidate because it was used in substantial quantities at Oxy Chem and was reported in the literature by Dow and the University of California in 1961 to produce effects on rat testicles at relatively low exposure concentrations.

Workers at two plants exposed to EDB without concomitant DBCP exposure were evaluated by NIOSH and Ethyl Corporation. We found no evidence of toxic effects on the sperm of these workers. A group of workers at Oxy Chem with exposure to Carbaryl, but not DBCP, were also tested and their sperm counts were found to be in the normal range.

NIOSH asked Dow and Shell, the primary manufacturers of DBCP, for their cooperation in securing additional data on the effects of the agents in question. The companies agreed to test their workers and share their data with NIOSH. Dow and Shell stopped production of DBCP while the examinations were being performed. NIOSH, OSHA, Oxy Chem, Dow and Shell communicated frequently during the month of August. In early September, the results of these investigations implicated DBCP as the agent responsible for the testicular toxicity. Literature searches also revealed DBCP to be an animal carcinogen in studies from the National Cancer Institute, and studies from other laboratories cited DBCP as a relatively potent mutagen.

In addition to seeking information from DBCP manufacturers, NIOSH has written to more than 130 formulators to learn about any data they may have

on health effects of the pesticide and to ask whether they have notified their employees and customers of the health problems associated with DBCP.

NIOSH transmitted to the Occupational Safety and Health Administration (OSHA) a proposed emergency standard for occupational exposure to DBCP in early September. The recommendations included an environmental exposure limit as well as medical surveillance guidelines. In addition, NIOSH recommended that records of occupational exposures be included with the employees' medical records and be retained for at least thirty years.

In September NIOSH began to plan for a Symposium on DBCP so that governmental agencies, industry and organized labor could share all available data. NIOSH also informed the Environmental Protection Agency (EPA) of our findings and suggested that applicators be investigated since studies at Oxy Chem indicated these workers might also be affected. EPA was given NIOSH's protocol and did study a group of applicators in California.

The NIOSH Symposium on DBCP held on October 20 and 21, 1977, was attended by representatives from NIOSH, OSHA, EPA, other federal government agencies, industry, labor and various state agencies. The data from Oxy Chem, Dow and Shell presented at this conference revealed that 45.6 percent, 65.1 percent, and 50 percent of workers tested had sperm counts less than 40 million sperm per millimeter respectively. These data are significantly different from the normal distributions in a study published by Dr. John MacLeod of Cornell. His data show that the expected percentage of those tested and found to have sperm counts of 40 million or less would be 20 to 30 percent.

Because of the testicular toxicity and animal carcinogenicity, all participants agreed on the need for a registry of individuals exposed to DBCP. The registry is currently being formed through the cooperative efforts of various governmental agencies and industry. We plan to study those workers who have been exposed to DBCP. We have two goals: first, to determine whether the testicular toxicity is reversible and second, a much longer surveillance effort to determine any additional adverse effects. Other pertinent findings from the Symposium on DBCP are summarized in the testimony presented at the OSHA hearing on DBCP, which I would like to submit for the record.

The identification and elimination of exposure to DBCP occurred with remarkable speed once the problem had been brought to the attention of government and industry officials. The major area of concern to us is how to address these problems before workers are unnecessarily exposed. Although the data on testicular toxicity from DBCP had been in the literature since 1961, the problem had not been acted upon. Despite convincing animal evidence of toxicity at low doses, no studies were undertaken in the workplace and no medical surveillance addressing reproductive effects were performed by the responsible companies.

In general, most of our concern about pesticide toxicity has been focused on acute toxicity and on chronic effects in laboratory animals. Epidemiologic studies and medical surveillance programs have not generally focused on reproductive effects. Perhaps this is because the research problems involved are inherently difficult and because there has been some



reluctance on the part of physicians and research workers to collect sperm samples routinely from workers.

As a result of the investigations of DBCP, NIOSH and occupational physicians have begun to look at reproductive effects of other pesticides, as well as other chemicals structurally similar to DBCP. We are not yet sure to what extent sperm analysis should be used in medical surveillance programs for workers exposed to chemicals.

Mr. Chairman, my colleagues and I will be pleased to answer any questions you may have.

