

NIOSH/HERB SPECIAL SESSION: OCCUPATIONAL RADIOEPIDEMIOLOGY II

Wednesday, 13 July 2005

Conference Theater

2:30 – 4:30 pm

WPM-E.1

THE IMPORTANCE OF INDUSTRIAL HYGIENE EXPOSURE ASSESSMENT IN RADIO-EPIDEMIOLOGY. D.D. Zaebs (National Institute for Occupational Safety and Health, 4676 Columbia Parkway, MS R-44, Cincinnati, OH 45226)

In almost any workplace in which one might study the effects of low-level ionizing radiation, there are chemical exposures that are integral to the process and to which many workers can be simultaneously exposed. This can lead to the problem, well recognized in epidemiology, known as confounding. In order to confound the radiation dose-response relationship, the exposure must be associated both with exposure to radiation and with the health effect being studied. It is important to account for this confounding since it can influence or bias the conclusions of the study. Not doing this can lead to spurious findings of associations of a health effect with the agent under study, or worse, result in not finding an association where in truth there is one. HERB scientists have conducted, and currently are conducting, studies in which a number of chemical exposures are present and are being assessed along with the radiation dose. For example, in a study of the relationship between external ionizing radiation and lung cancer at a nuclear naval shipyard, historical worker exposures to asbestos and welding fumes are being reconstructed. This is being done since it is likely that such industrial hygiene exposures are associated with radiation exposures and with lung cancer. Similarly, a study of the relationship between internal dose from plutonium deposition and lung cancer at Rocky Flats assessed the potential confounding effects of a number of chemical agents, including asbestos and carbon tetrachloride. In conducting such studies, historical industrial hygiene data are typically sporadic, are limited in quantity and quality, and often are problematic in reconstructing exposures. A variety of creative exposure assessment techniques have been used to quantitatively or qualitatively estimate historical exposures in studies of the adverse effects of ionizing radiation, and these will be presented and discussed.

WPM-E.2

A NESTED CASE-CONTROL STUDY OF LEUKEMIA AND IONIZING RADIATION AT THE PORTSMOUTH NAVAL SHIPYARD. T.L. Kubale,¹ R. D. Daniels,¹ J. H. Yiin,¹ G. M. Kinnis,¹ J. R. Couch,² and M.K. Schubauer-Berigan¹ (¹National Institute for Occupational Safety and Health, 4676 Columbia Parkway, MS R-44, Cincinnati, OH 45226; ²Westat Inc.)

A nested case-control study using conditional logistic regression was conducted to evaluate any exposure-response relationship between external ionizing radiation and leukemia mortality among civilian workers at the Portsmouth (New Hampshire) Naval Shipyard (PNS). The study age-matched 115 leukemia deaths with 420 controls selected from a cohort of 37,853 civilian workers employed at PNS between 1952 and 1992. In addition to badge doses, exposures to work-related medical x-rays (WRX) were included in the analysis, and adjustment was made for solvent exposure. A significant positive association was found between leukemia mortality and level of external radiation exposure, adjusting for sex, radiation worker status, and solvent exposure duration. Solvent exposure was significantly associated with leukemia mortality adjusting for radiation dose, radiation worker status, and sex.

WPM-E.3

NON-HODGKIN LYMPHOMA & HEMATOPOIETIC CANCER MORTALITY AMONG IDAHO NATIONAL ENGINEERING AND ENVIRONMENTAL LABORATORY WORKERS. M.K. Schubauer-Berigan,¹ G.V. Macievic,² D.F. Utterback,¹ and C-Y. Tseng¹ (¹National Institute for Occupational Safety and Health, Division of Surveillance, Hazard Evaluations, and Field Studies, 5555 Ridge Avenue, MS-R15, Cincinnati, OH 45220; ²NIOSH, Office of Compensation Analysis and Support)

An epidemiologic study of 63,561 workers ever employed at the Idaho National Engineering and Environmental Laboratory between its 1949 construction and 1991 was recently completed. Workers were followed for mortality through 1999, and exposures to external ionizing radiation were assessed through 1998. Workers were also classified by likelihood of potential exposures to internal radiation. The relation of internal ionizing radiation exposures to mortality from lymphatic and hematopoietic cancers was assessed using Poisson regression. The rate of death from non-Hodgkin lymphoma was elevated in the cohort compared to the general population (Standardized Mortality Ratio = 1.26, 95% CI: 1.05, 1.50). Mortality was elevated among workers with cumulative doses of 100 mSv or greater,

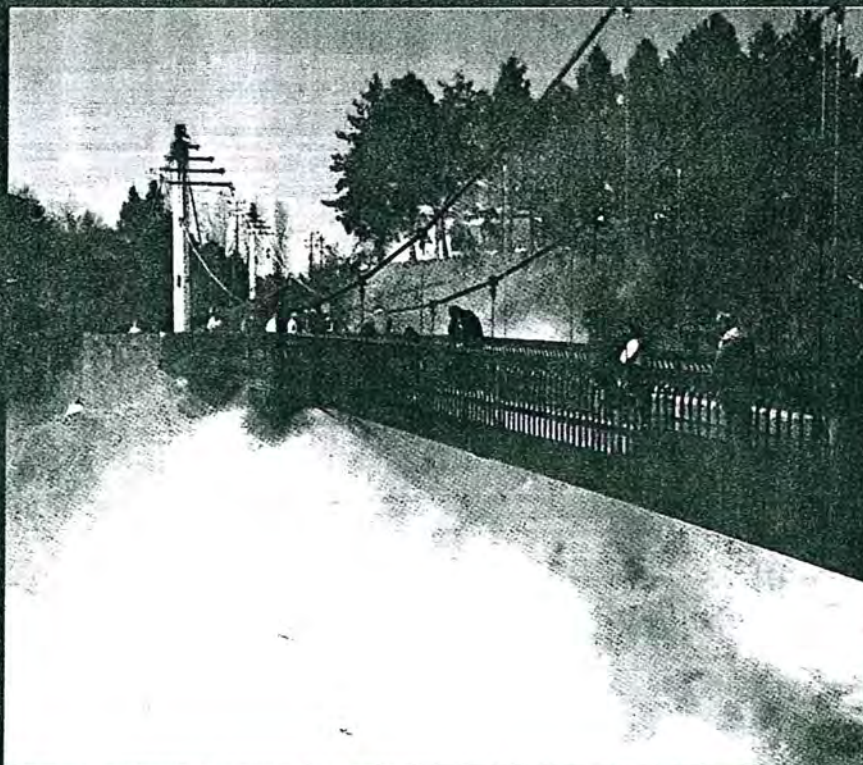
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