117

Occupational Exposure to 60-Hz Magnetic Fields and Risk of Breast Cancer in Women. P. Coogan,* R. Clapp, T. Wenzl, P. Newcomb, M. P. Longnecker, J. Baron (Boston University School of Public Health, Boston, MA 02118).

The relative risk of breast cancer in women with occupational exposure to 60-Hz magnetic fields was evaluated in a population-based case control study including 6,888 newly diagnosed cases from Wisconsin, Massachusetts, New Hampshire and Maine. Controls (n=9529) were randomly selected from driver's license and Health Care Administration files. Information on subject's usual occupation and information on breast cancer risk factors was ascertained by telephone interview. Occupations were classified into four categories of likelihood of exposure to 60-Hz magnetic fields: high (n=122), medium (n=247), low (n=1390), and none (n=14,567). Multivariate logistic regression models were used to calculate odds ratios (OR) adjusted for potential confounders, and 95% confidence intervals (CI). Compared to women with no likelihood of exposure, there was a modest increase in risk for women with high likelihood of exposure (OR=1.44, CI 0.99-2.10), and no increase for women with medium (OR=1.09, CI 0.83-1.42) or low (OR=1.02, CI 0.91-1.15) likelihood of exposure. Among premenopausal women, the risk for women in the highest exposure group was 2.00 (CI 1.05-3.80), while it was 1.34 (95% CI 0.82-2.18) among postmenopausal women. These data suggest that there may be an association between job-related exposure to 60-Hz magnetic fields and risk of breast cancer in women.

118

Carpenters Employed in US Construction or Wood Products Industries Proportionate Mortality 1987-1990. C.F. Robinson,* S. Palu (National Institute for Occupational Safety and Health, Cincinnati, OH 45226).

The study was conducted to evaluate the mortality of 27,362 members who died 1987-1990 of the U.S. Carpenters' Union for preventable causes associated with occupational exposures in the construction or wood products industries. Age- adjusted proportionate mortality ratios (PMRs) and proportionate cancer mortality ratios (PCMRs) were computed using the U.S. age, gender and race specific death rates for comparison. For carpenters who were last employed while in construction industry locals, raised mortality was restricted to lung cancer (PCMR=107, N=2327, CI=103,111), bone cancer (PCMR=181, N=18, CI=107,286), lymphatic cancer (PCMR=112, N=326, CI=101,125), emphysema (PMR=115, N=274, CI=102,130), transportation injuries (PMR=121, N=330, CI=109,135), and falls (PMR=122, N=158, CI=104,142). For carpenters who were last employed while in industrial wood products locals, significantly raised mortality was confined to stomach cancer (PCMR=187, N=44, CI=136,250), male breast cancer (PCMR=469, N=4, CI=128,720), and transportation injuries (PMR=136, N=65, CI=110,173). Excess breast cancer was associated with last employment in wood machining trades. Nasal cancer mortality was not elevated, due to its high survival rate. 24 pleural mesotheliomas were observed among carpenters last employed in construction locals. Multiple cause of death analyses revealed raised mortality for these and additional causes. 4594 of 27,362 (18%) death certificates mentioned pneumoconioses as a contributing factor. Limitations prevent drawing firm conclusions, but raised mortality from lung and lymphatic cancer, mesothelioma, and injuries among U.S. construction carpenters confirm known hazards of construction.

119

Cancer Mortality in the German Rubber Industry. K. A. Mundt,* S. K. Weiland, A. Bucher, T. Birk, B. Kraemer, M. Person, U. Keil (Institut für Epidemiologie und Sozialmedizin, Universität Münster, Domagkstrae 3, D-48129 Münster, Germany).

A cohort of 15,499 rubber workers was followed for mortality from January 1, 1981 through December 31, 1991. The cohort consisted of German male workers employed for at least one year at one of three companies. Cohort members were active (n=7,536) or retired (n=4,189) as of January 1, 1981 or hired since that date (n=3,714). Vital status was ascertained for 99.6% of the cohort, and cause of death determined from death certificates for 96.4% of the decedents. Adjusting for age and calendar year, and using national reference rates, the standardized mortality ratio (SMR) and 95% confidence interval (CI) for all causes among retirees (2,000 deaths) was 113 (CI=108,118); for active workers (727 deaths), SMR=95 (CI=89,103); and among new hires (13 deaths), SMR=65 (CI=35,112). For all cancers, SMR=114 (CI=105,124) for retirees, and SMR=106 (CI=93,119) for active workers. No cancer deaths were observed among recent hires. Lung cancer was elevated for both retirees SMR=134 (CI=115,157) and active workers SMR=124 (CI=100,152), as was pleural cancer: SMR=530 (CI=282,906) and SMR=222 (CI=60,570), respectively. Among retirees only, SMRs were elevated for additional cancers: pharynx SMR=238 (CI=95,491); larynx SMR=155 (CI=67,306); bladder SMR=126 (CI=84,182) and leukemia SMR=164 (CI=103,248). Stomach cancer was elevated among active employees SMR=148 (CI=99,214), but not retirees SMR=95 (CI=69,127). No lymphoma, brain or liver cancer excesses were observed. Further

120

Case-Control Study of Brain Tumors and Ionizing Radiation Nested within a Cohort of Nuclear Workers. J. H. DiMarco,* G.S. Wilkinson, (University of Texas Medical Branch, Galveston, TX 77555).

The association between mortality from brain tumors and exposure to ionizing radiation has been well documented for medically treated populations. However, conflicting evidence exists regarding this association among nuclear workers. This report presents the results of a nested case control study of cumulative exposure to ionizing radiation and brain tumor mortality among workers at the Rocky Flats Nuclear Weapons Plant. Based on follow up through 1990, 23 white male cases and 4 controls matched on birth year and length of employment were identified. When workers were stratified on length of employment, an odds ratio of 5.5 (90% Confidence Limits (CL)=1.0, 32.0) was found for exposures to external radiation 1 rem compared with < 1 rem in workers who were employed < 2 years. For workers employed 2 years an odds ratio of 3.0 (90% CL=1.2, 7.8) was found, and an adjusted odds ratio of 3.4 (90% CL=1.5, 8.1) was obtained for the two combined strata. No association between brain tumors and plutonium exposures was observed. Although limited by a small number of cases, these findings are consistent with a recently reported association between exposure to external radiation and brain tumor mortality among Los Alamos National Laboratory workers. Together these findings suggest that cumulative exposure to low levels of ionizing radiation may convey an increased risk for brain tumors.

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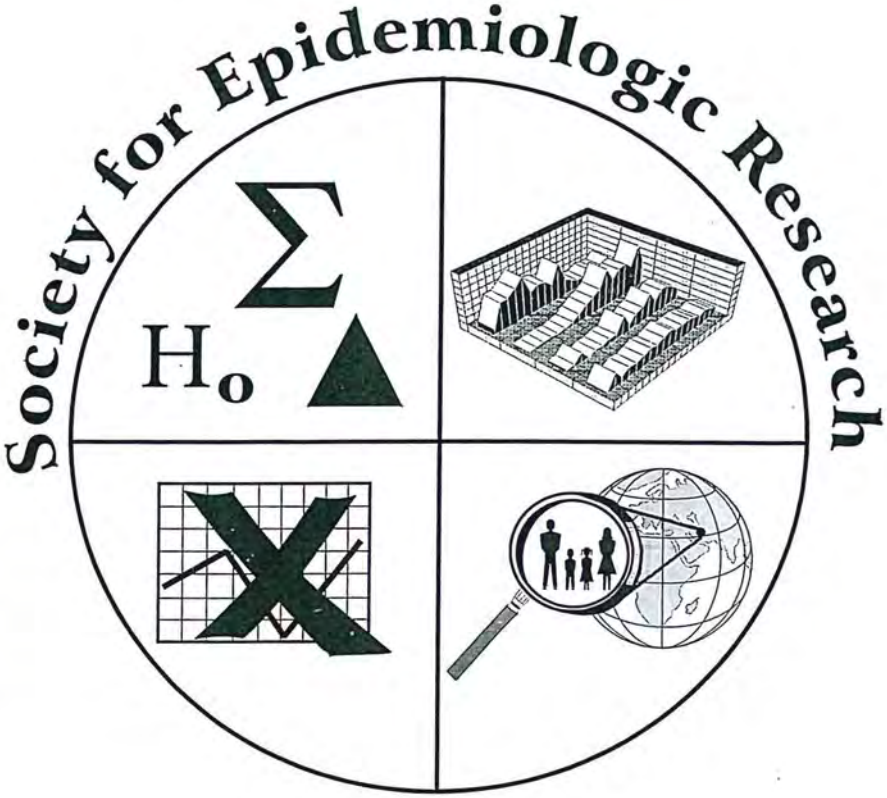

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