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METABOLIC CONSEQUENCES OF EXPOSURE TO POLYCHLORINATED BIPHENYLS (PCB) IN SEWAGE SLUDGE

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Polychlorinated biphenyls (PCB) were discovered in sewage sludge used for fertilizer in Bloomington, Indiana. The PCB had been discharged into the municipal sewage system by an electrical capacitor manufacturing plant. To study the epidemiology and metabolic consequences of PCB exposure an epidemiologic and clinical survey was conducted. Mean serum PCB levels were 17.4 ppb in 89 sludge users, 75.1 ppb in 18 workers with occupational exposure to PCB, 33.6 ppb in 19 members of those workers' families, and 24.4 ppb in 22 community residents without unusual exposure to PCB. In sludge users PCB levels were associated positively with per cent performance of garden care ($p = 0.035$) and negatively with wearing gloves while gardening ($p = 0.021$), but were not significantly associated with the amount of sludge used or the duration of exposure. In no groups were chloracne or systemic symptoms of PCB toxicity noted, nor were significant correlations found between PCB levels and tests of hematologic, hepatic, or renal function. Plasma triglyceride levels increased significantly with serum PCB concentrations in both alcohol drinkers and nondrinkers ($r = 0.541, n = 36, p < 0.001$ for nondrinkers). These data indicate that PCB may alter lipid metabolism at levels of exposure and bioaccumulation insufficient to produce overt symptoms.

polychlorobiphenyl compounds; sewage; triglycerides

The proper disposal of human waste is a fundamental concern of public health. Each day approximately 8 billion gallons of municipal waste containing some 17,000 dry tons of sediments (sludges) are

produced in the United States (1). The safe removal of this material has become increasingly difficult as necessarily stringent restrictions have been placed on the traditional practices of incineration (2),

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Abbreviations: BUN, blood urea nitrogen; CPK, creatine phosphokinase; GGTP, gamma glutamyl transpeptidase; HDL-C, high-density lipoprotein cholesterol; LDH, serum lactic dehydrogenase; PCB, polychlorinated biphenyls; ppb, parts per billion; ppm, parts per million; SGOT, serum glutamic oxaloacetic transaminase; SGPT, serum glutamic pyruvic transaminase.

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