Meetings

Beryllium Disease

The prevalence of beryllium disease, its prevention, its pathogenesis and relation to cancer, and the experiences of patients seeking compensation were discussed at a National Symposium on the Current Status of Beryllium as an Occupational Hazard held at Case Western Reserve University on 3 October 1973.

The frequent occurrence of beryllium disease was pointed out by H. Kazemi, who noted that the Beryllium Case Registry at the Massachusetts General Hospital now contains records on 837 cases of beryllium disease. New cases continue to appear even though a threshold limit value (TLV) for safe exposure to beryllium was adopted by industry in 1950. That half of the 76 new cases since 1966 were exposed to beryllium after 1950 prompted speculation on whether there was regular compliance with the current beryllium TLV of 2 micrograms per cubic meter or whether monitors accurately sampled the beryllium concentration.

D. Smith (NIOSH) reported that this same TLV has now been recommended to but not yet adopted by the Occupational Safety and Health Agency. If adopted, this limit would be the standard by which worker exposure would be judged to be safe. Despite general agreement on the TLV, problems still exist regarding sampling techniques and interpretation of sampling data. Members of the panel on monitoring (R. Chamberlin, Massachusetts Institute of Technology; H. Donaldson, NIOSH; and H. Schute, Los Alamos) called attention to the differences in results obtained when different sampling devices were used simultaneously to evaluate an exposure. The need to fully understand the hazard potential for any operation was also stressed. More comparisons among different devices used for monitoring, and detailed studies of each operation are needed. H. Hardy suggested the establishment of a registry for the evaluation of such monitoring data from industry.

From an epidemiologic study of employees of a beryllium plant, T. Mancuso (University of Pittsburgh) reported that age-adjusted mortality rates for lung cancer indicate beryllium to be an etiologic factor in its development. In a cohort of employees that had prior respiratory illness due to beryllium, the rate of mortality from lung cancer was higher than in two other cohorts, one of all the plant's employees and the other of those who had not had such respiratory illness. While the numbers of cases were small, the rates were statistically significant evidence that beryllium is an occupational carcinogen. Some viewed these conclusions to be tentative, for it was noted that other populations of beryllium workers have not been, and need to be, similarly studied. Additional data from a larger number of beryllium workers suggested that deaths from carcinoma of the liver and biliary tract might also be related to exposure.

The follow-up of beryllium workers and the identification of previous cases of the disease for epidemiologic studies remains difficult. In the first instance, workers and exworkers may not know of their past beryllium exposure; in the second, the fibrotic end stage of the disease may be nonspecific. Because of these conditions, longitudinal studies of beryllium workers would be helped by incentives for pathologists to do beryllium analyses on postmortem lungs of workers or exworkers and on patients with interstitial fibrosis where there is doubt about occupational exposure.

Viewing the pathogenesis of chronic beryllium disease to be a hypersensitivity reaction, S. Doedhar (Cleveland Clinic) demonstrated delayed hypersensitivity to beryllium in patients with chronic beryllium disease and in a small number of exposed workers who did not appear to have the disease. Delayed hypersensitivity was demonstrated by showing a transformation in vitro of lymphoblasts to beryllium ions.

In a study of what beryllium patients experienced in seeking compensation from an industrial accident board, J. Stoeckle, H. Hardy, and B. C-W Ling (Massachusetts General Hospital) compared beryllium patients to those with work-related fractures. Compared to fracture patients, those with beryllium disease had long delays in adjudication of claims. Delay appeared related to litigation since beryllium patients' claims were contested, while those with fractures were not. Fracture patients were satisfied with their experience while beryllium patients developed a "theory of corruption" to account for adjudication delay, attributing it to "pay offs" within the industrial accident system. Compensation benefits were inadequate, particularly for women with children, resulting in financial hardships and loss of job mobility.

Reflecting on H. Hardy's historical account of beryllium disease and the new information about lung cancer, I. J. Selikoff noted that beryllium disease is a paradigm of not only other industrial diseases but of many chronic illnesses. Multiple clinical disorders may occur many years after a hazardous industrial exposure. Because disorders develop late, workers may have had exposure to still other environmental hazards as etiologic factors in their illness.

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See the Preconvention Issue (11 January 1974, pages 105–114) for details of lectures and symposia.