

Acute Beryllium Disease: Reconsideration of a Historical Entity.

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Introduction: While chronic beryllium disease is clearly an immune-mediated granulomatous process, acute beryllium disease is commonly considered an irritative chemical phenomenon occurring at exposures $>100 \mu\text{g}/\text{m}^3$. We aimed to determine the epidemiologic and pathophysiologic associations between acute and chronic beryllium diseases.

Methods: Beryllium manufacturing workers were surveyed in 1993–1994. We examined associations between beryllium sensitization or chronic beryllium disease and workers' reports of past symptoms of acute beryllium disease. We reviewed medical records to identify symptomatic workers who had undergone relevant diagnostic testing and analyzed relevant historical airborne beryllium exposure measurements.

Measurements and Main Results: Of 632 survey participants, 260 (41%) reported beryllium fluoride-related skin rash, 36 (6%) beryllium fluoride-related cough or breathing problems, and 29 (5%) both rash and breathing problems. The 48 (8%) with beryllium sensitization or chronic beryllium disease had two-fold greater odds of having a history of symptoms of acute beryllium disease. Two workers with classic presentations of acute beryllium disease had undergone extensive diagnostic testing. Within weeks after exposure to beryllium fluoride began, each had systemic illness characterized by dermal and respiratory symptoms and precipitous declines in pulmonary function. Symptoms and pulmonary function abnormalities improved with cessation of exposure and, in one worker, recurred with repeat exposure. Bronchoalveolar lavage fluid analyses and blood beryllium lymphocyte proliferation tests revealed lymphocytic alveolitis and cellular immune recognition of beryllium. Workers' airborne beryllium levels were below $100 \mu\text{g}/\text{m}^3$.

Conclusions: Contrary to common understanding, evidence suggests that acute and chronic beryllium diseases represent a continuum and both involve hypersensitivity reactions to beryllium.

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