

Chronic Beryllium Disease and the Construction Worker

Beryllium Disease among Construction Trade Workers at Department of Energy Nuclear Sites

Laura Welch, MD, Knut Ringen, DrPH, John Dement, PhD, Eula Bingham, PhD, Patricia Quinn, BA, Janet Shorter, BA, and Miles Fisher, BA. American Journal of Industrial Medicine, October 2013.

Overview

Much is already known about the risks of acute exposure to beryllium dust; researchers have extensively documented the skin and lung disorders exhibited by workers who mine, smelt or otherwise encounter high exposures to the metal. However, many construction workers at nuclear weapons facilities operated by the Department of Energy (DOE) have been exposed to relatively low levels of beryllium for many years. Researchers used data from a medical surveillance program for these workers to establish disease rates for these workers. Blood tests of nearly 14,000 of these workers revealed beryllium sensitivity in 189, or 1.4%. Of these workers, at least 28 had exhibited sufficient evidence of Chronic Beryllium Disease (CBD), a chronic lung disease, to qualify for compensation from the federal government under the Energy Employees Occupational Illness Compensation Program Act (EEOICPA).

Key Findings

- Between 1998 and 2010, 13,810 workers received a blood test through the program, indicating that 189 (1.4%) were sensitized to beryllium.
- Workers in certain trades were found to have elevated rates of beryllium sensitivity: 2% or more of the boilermakers, roofers, and sheet metal workers tested positive for beryllium sensitivity.
- Researchers interviewed 136 surviving workers with beryllium sensitivity, finding that 86 had undergone additional diagnostic testing. Twenty-five (25) of the survivors had exhibited sufficient evidence of Chronic Beryllium Disease (CBD) to qualify for compensation under EEOICPA. In addition, researchers identified three additional workers who had suffered from CBD and qualified for EEOICPA compensation but who were deceased or unavailable for interview.
- Fifteen percent (15%) of all the beryllium-sensitized workers – 30% of those who underwent the additional diagnostic testing – were found to have CBD. This proportion of CBD diagnosed among sensitized workers is lower than what has been reported in other studies. The authors hypothesize that these construction workers may have had significant exposure to beryllium through skin contact rather than through inhalation, and that sensitization through skin contact may be less likely to result in chronic lung disease than sensitization through inhalation.

For more information, contact:

Laura Welch: lwelch@cpwr.com

See abstract

<http://www.ncbi.nlm.nih.gov/pubmed/23794247>

©2013, CPWR – The Center for Construction Research and Training. CPWR, the research and training arm of the Building and Construction Trades Dept., AFL-CIO, is uniquely situated to serve construction workers, contractors, practitioners, and the scientific community. This card was made possible by a cooperative agreement with the National Institute for Occupational Safety and Health, NIOSH (OH009762). The contents are solely the responsibility of the authors and do not necessarily represent the official views of NIOSH.



**THE CENTER FOR CONSTRUCTION
RESEARCH AND TRAINING**

WWW.CPWR.COM

Beryllium Disease Among Construction Trade Workers at Department of Energy Nuclear Sites

Laura S. Welch, MD,^{1*} Knut Ringen, Dr. PH,¹ John Dement, PhD,² Eula Bingham, PhD,³ Patricia Quinn, BA,¹ Janet Shorter, BA,⁴ and Miles Fisher, BA¹

Background A medical surveillance program was developed to identify current and former construction workers at significant risk for beryllium related disease from work at the DOE nuclear weapons facilities, and to improve surveillance among beryllium exposed workers.

Methods Medical examinations included a medical history and a beryllium blood lymphocyte proliferation test (BeLPT). Stratified and multivariate logistic regression analyses were used to explore the risk of disease by age, race, trade, and reported work in buildings where beryllium was used. After adjusting for covariates, the risk of BeS was significantly higher among boilermakers, roofers, and sheet metal workers, as suggested in the stratified analyses. Workers identified as sensitized to beryllium were interviewed to determine whether they had been subsequently diagnosed with chronic beryllium disease.

Results Between 1998 and December 31, 2010 13,810 workers received a BeLPT through the BTMed program; 189 (1.4%) were sensitized to beryllium, and 28 reported that they had had a compensation claim accepted for CBD.

Conclusions These data on former construction workers gives us additional information about the predictive value of the blood BeLPT test for detection of CBD in populations with lower total lifetime exposures and more remote exposures than that experienced by current workers in beryllium machining operations. Through this surveillance program we have identified routes of exposures to beryllium and worked with DOE site personnel to identify and mitigate those exposures which still exist, as well as helping to focus attention on the risk for beryllium exposure among current demolition workers at these facilities. *Am. J. Ind. Med.* © 2013 Wiley Periodicals, Inc.

KEY WORDS: beryllium; construction; medical surveillance

BACKGROUND

In 1993, Congress added Section 3162 to the Defense Authorization Act, calling for the Department of Energy (DOE) to determine whether workers within the nuclear weapons facilities were at “significant risk” for work-related illnesses and if so, to provide them with medical surveillance. In 1996 DOE initially established six pilot programs, including three programs directed at construction workers at the Hanford Nuclear Reservation in Richland, Washington, the Oak Ridge Reservation in Oak Ridge, Tennessee, and the Savannah River Site (SRS) in Aiken, SC.

By then, beryllium had been identified as a significant source of occupational disease risk within the DOE complex,

¹Center for Construction Research and Training, Silver Spring, Maryland

²Division of Occupational and Environmental Medicine, Duke University Medical Center, Durham, North Carolina

³Department of Environmental Health, University of Cincinnati Medical Center, Cincinnati, Ohio

⁴Zenith American Solutions, Covina, California

Contract grant sponsor: U.S. Department of Energy; Contract grant numbers: DE-FC03-96SF21262; DE-FC03-97SF21514; DE-FC03-96SF21263.

Disclosure Statement: The authors report no conflicts of interests.

*Correspondence to: L. Welch, Center for Construction Research and Training (CPWR), 8484 Georgia Ave., Silver Spring, MD 20910. E-mail: lwelch@cpwr.com

Accepted 10 April 2013

DOI:10.1002/ajim.22202. Published online in Wiley Online Library (wileyonlinelibrary.com).