

Abstract submitted for the 13th International Congress of the International Radiation Protection Association, Glasgow, 13-18 May 2012.

Mortality From Cardiovascular Diseases And Occupational Uranium Exposure: Cohort And Nested Case-Control Studies Of French Uranium Workers

I. Guseva Canu¹, J.P. Garsi¹, L. Chablais¹, E. Samson¹, I. Jovanovich¹, S. Caër-Lorho¹, A. Acker², C. Niogret², D. Laurier¹

¹Institut de Radioprotection et de Sûreté Nucléaire, ²AREVA ; France

The risk of cardiovascular mortality (CVM) among French uranium workers after protracted low-dose exposure to different uranium compounds, was investigated among 2897 workers (79892 person-years) employed at the AREVA NC Pierrelatte uranium processing plant (1960-2006).

Cumulative exposure to different uranium compounds, classified by isotopic composition and solubility-type, was assessed using a plant-specific job-exposure-matrix. Hazard ratios and associated 95%-confidence intervals (HR [95%CI]) were estimated using Cox regression models accounting for sex, calendar period, initial socioeconomic status and associated exposure. A case-control study was nested into the cohort to address the role of individual biological and lifestyle parameters.

At the end of follow-up, 111 CVM cases were observed. The CVM risk was increased only among workers exposed to insoluble compounds of reprocessed (HR=2.07[0.99-4.99], n=9) and natural uranium (HR=1.73[1.11-2.69], n=41), after adjustment for solvents and heat exposure.

The nested case-control study including all the CVM cases and 397 referents (matched by sex and 5-year age class) has been set up. Anthropometric (height, weight), biomedical (blood and urine biochemical analyses, diagnostic X-ray exposure), anamnesis and treatment, as well as smoking and alcohol consumption data were computerized on an annual basis using individual workers' occupational medicine records and analyses are ongoing.

Our cohort study is the first suggesting an increasing risk of CVM related to insoluble uranium exposure. The results highlight the importance of taking into account solubility. The nested case-control study will refine our exposure-response analysis and provide results adjusted for known CVM risk factors in order to draw an appropriate conclusion.