

Current study about health effects in chromate manufacturing workers, China

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Chromium (Cr) compounds are produced and applied world widely. Therefore the public attention has been paid to its adverse health effects produced by occupational exposure. We systematically studied the health effects through a retrospective cohort study of five years. In our study, one hundred and fifteen workers were recruited from chromate producing facilities as exposure group and one hundred local residents without chromium exposure history served as controls. Personal sampling of airborne Cr was conducted; Blood and urine samples were collected. From a series of experiments, we draw some conclusions as follows: 1.90% of the chromate production workers were exposed to airborne Cr in a concentration lower than 50 ug/m³, which is the threshold limit value recommended by the American Conference of Governmental Industrial Hygienists and Chinese Ministry of Health; 2. Chronic Cr exposure could produce potential prostate injury and the nonspecific inflammation at least might be one of the reasons to explain the elevated concentration of total prostate specific antigen (PSA) in chronic occupational chromate exposed workers; 3. Chronic occupational exposure to chromate causes comprehensive renal impairment though more severity could occur in the tubule than in the glomeruler. 4. The increase of Cr in peripheral blood and urine samples and binucleated cells with micronuclei (BNMN) frequencies suggest BNMN frequencies could be used to detect early DNA damage in the chromate production health surveillance; 5. Chronic occupational chromate exposure could induce folate depletion, which may further promote DNA damage and global DNA hypomethylation.

Biography

Yang Li is a Ph.D. from Department of Occupational and Environmental Health Science, School of Public Health, Peking University. His research topic is genetic and epigenetic damage of chromium. His research also involves exposure assessment and biomarker development.

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