

Dose-response relationship between ischemic heart disease mortality and long-term arsenic exposure.

邱弘毅

Chen CJ;Chiou HY;Chiang MH;Lin LJ and Tai TY

Abstract

The cardiovascular effects of inorganic arsenic have been documented, but the dose-response relationship between ischemic heart disease (ISHD) and long-term arsenic exposure remains to be elucidated. Mortality rates from ISHD among residents in 60 villages of the area in Taiwan with endemic arseniasis from 1973 through 1986 were analyzed to examine their association with arsenic concentration in drinking water. Based on 1 355 915 person-years and 217 ISHD deaths, the cumulative ISHD mortalities from birth to age 79 years were 3.4%, 3.5%, 4.7%, and 6.6%, respectively, for residents who lived in villages in which the median arsenic concentrations in drinking water were <0.1, 0.1 to 0.34, 0.35 to 0.59, and > or = 0.6 mg/L. A cohort of 263 patients affected with blackfoot disease (BFD), a unique arsenic-related peripheral vascular disease, and 2293 non-BFD residents in the endemic area of arseniasis were recruited and followed up for an average period of 5.0 years. There was a monotonous biological gradient relationship between cumulative arsenic exposure through drinking artesian well water and ISHD mortality. The relative risks were 2.5, 4.0 and 6.5, respectively, for those who had a cumulative arsenic exposure of 0.1 to 9.9, 10.0 to 19.9, and > or = 20.0 mg/L-years compared with those without the arsenic exposure after adjustment for age, sex, cigarette smoking, body mass index, serum cholesterol and triglyceride levels, and disease status for hypertension and diabetes through proportional-hazards regression analysis. BFD patients were found to have a significantly higher ISHD mortality than non-BFD residents, showing a multivariate-adjusted relative risk of 2.5 (95% CI, 1.1 to 5.4).