

Low serum carotene level and increased risk of ischemic heart disease related to long-term arsenic exposure.

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Abstract

To elucidate the association between arsenic-related ischemic heart disease (ISHD) and serum antioxidant micronutrient level, residents aged 30 or older living in arseniasis-hyperendemic villages in Taiwan were recruited in a community-based health survey. A structured questionnaire was used to obtain a history of long-term exposure to arsenic through consuming artesian well water and fasting serum samples were also collected at the recruitment. A total of 74 patients affected with ISHD, who were diagnosed through both electrocardiography and Rose questionnaire interview, and 193 age-sex-matched healthy controls were selected for the examination of serum levels of micronutrients by high performance liquid chromatography (HPLC). There was a significant biological gradient between the risk of ISHD and the duration of consuming high-arsenic artesian well water. A significant reverse dose-response relationship with arsenic-related ISHD was observed for serum level of alpha- and beta-carotene, but not for serum levels of retinol, lycopene and alpha-tocopherol. Multivariate analysis showed a synergistic interaction on arsenic-related ISHD between duration of consuming artesian well water and low serum carotene level. An increased risk of arsenic-related ISHD was also associated with hypertension and elevated body mass index, but not with serum lipid profile, cigarette smoking and alcohol drinking. The findings seem to suggest that arsenic-related ISHD has a pathogenic mechanism which is at least partially different from that of ISHD unrelated to long-term exposure to arsenic.