

Epidemiology evidence of diabetogenic effect of arsenic

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Abstract

It is well documented that arsenic can lead to skin lesions, atherosclerotic diseases and cancers. The association between arsenic exposure and diabetes mellitus is a relatively new finding. Up to now, there are six epidemiologic reports linking diabetes mellitus with arsenic exposure from environmental and occupational sources. Two reports in Taiwan carried out in the blackfoot disease-hyperendemic villages, one cross-sectional and one prospective follow-up of the same cohort, indicate that arsenic exposure from drinking artesian well water is associated with prevalence and incidence of diabetes mellitus in a dose-responsive pattern. The observation of the relation between arsenic exposure and diabetes mellitus is further supported by studies carried out in Sweden and Bangladesh. In Sweden, case-control analyses of death records of copper smelters and glass workers revealed a trend of increasing diabetes mellitus with increasing arsenic exposure from inhalation. In Bangladesh, prevalence of diabetes mellitus among arsenic-exposed subjects with keratosis was about five times higher than unexposed subjects. Increasing trends of diabetes mellitus with indices of arsenic exposure in drinking water seems to be independent of the presence of skin lesions associated with arsenic exposure. Although these studies consistently show an association between arsenic exposure and diabetes mellitus, the weak study designs of cross-sectional or case-control, the use of glucosuria or diabetes death as diagnostic criteria and the lack of adjustment for possible confounders in some studies, are major limitations that may reduce the strength of the evidence.