Exposure, metabolism, and health effects of arsenic in residents from arsenic-contaminated groundwater areas of Vietnam and Cambodia: A review

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Abstract: In this review, we summarize the current knowledge on exposure, metabolism, and health effects of arsenic (As) in residents from As-contaminated groundwater areas of Vietnam and Cambodia based on our findings from 2000 and other studies. The health effects of As in humans include severe gastrointestinal disorders, hepatic and renal failure, cardiovascular disturbances, skin pigmentation, hyperkeratosis, and cancers in the lung, bladder, liver, kidney, and skin. Arsenic contamination in groundwater is widely present at Vietnam and Cambodia and the highest As levels are frequently found in groundwater from Cambodia. Sand filter system can reduce As concentration in raw groundwater. The results of hair and urine analyses indicate that residents from these As-contaminated areas are exposed to As. In general, sex, age, body mass index, and As exposure level are significantly associated with As metabolism. Genetic polymorphisms in arsenic (+III) methyltransferase and glutathione-5-transferase isoforms may be influenced As metabolism and accumulation in a Vietnamese population. It is suggested oxidative DNA damage is caused by exposure to As in groundwater from residents in Cambodia. An epidemiologic study on an association of As exposure with human health effects is required in these areas.

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