Arsenic Exposure;Urinary Arsenic Speciation and the Incidence of Urothelial Carcinoma: a Twelve-year Follow-up Study

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摘要

Abstract

The risk of urothelial carcinoma (UC) and urinary arsenic speciation have been evaluated in a few case-control studies; however, the association has not been verified in a prospective cohort study. The aim of this study was to examine the association between urinary arsenic speciation and the incidence of UC in a cohort study. A total of 1,078 residents of southwestern Taiwan were followed for an average of 12 years. A high-performance liquid chromatography/hydride generator and an atomic absorption spectrometry were used to measure urinary arsenite, arsenate, monomethylarsonic acid (MMA(V)), and dimethylarsinic acid (DMA(V)). The incidence of UC was estimated by examining the National Cancer Registry of Taiwan between January 1985 and December 2001. There were 37 newly diagnosed cases of UC during a follow-up period of 11,655 person-years. Significantly higher percentages of MMA(V) and lower percentages of DMA(V) existed among the patients with UC than among the healthy residents. After adjustment for age, gender, educational level, and smoking status, the percentage of urinary DMA(V) was shown to have an inverse association with the risk of UC, having a relative risk (RR) of the tertile strata of 1.0, 0.3, and 0.3, respectively ($p < 0.05$ for the trend test). The RR (95% confidence interval) of residents with a cumulative arsenic exposure (CAE) of >/=20 mg/l-year and a higher percentage of MMA(V) or a CAE of > or =20 mg/l-year and a lower percentage of DMA(V) was 3.7 (1.2-11.6) or 4.2 (1.3-13.4) compared to residents with a CAE of <20 mg/l-year and a lower percentage of MMA(V) or a CAE of <20 mg/l-year and a higher percentage of DMA(V)respectively. There was a significant association between inefficient arsenic methylation and the development of UC in the residents in the high CAE exposure strata in an area of southwestern Taiwan endemic for arseniasis.

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