

# **Effect of plasma homocysteine level and urinary monomethylarsonic acid on the risk of arsenic-associated carotid atherosclerosis**

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## **摘要**

Arsenic-contaminated well water has been shown to increase the risk of atherosclerosis. Because of involving S-adenosylmethionine, homocysteine may modify the risk by interfering with the biomethylation of ingested arsenic. In this study, we assessed the effect of plasma homocysteine level and urinary monomethylarsonic acid (MMA(V)) on the risk of atherosclerosis associated with arsenic. In total, 163 patients with carotid atherosclerosis and 163 controls were studied. Lifetime cumulative arsenic exposure from well water for study subjects was measured as index of arsenic exposure. Homocysteine level was determined by high-performance liquid chromatography (HPLC). Proportion of MMA(V) (MMA%) was calculated by dividing with total arsenic species in urine, including arsenite, arsenate, MMA(V), and dimethylarsinic acid (DMA(V)). Results of multiple linear regression analysis show a positive correlation of plasma homocysteine levels to the cumulative arsenic exposure after controlling for atherosclerosis status and nutritional factors ( $P < 0.05$ ). This correlation, however, did not change substantially the effect of arsenic exposure on the risk of atherosclerosis as analyzed in a subsequent logistic regression model. Logistic regression analyses also show that elevated plasma homocysteine levels did not confer an independent risk for developing atherosclerosis in the study population. However, the risk of having atherosclerosis was increased to 5.4-fold (95% CI, 2.0-15.0) for the study subjects with high MMA% ( $\geq 16.5\%$ ) and high homocysteine levels ( $\geq 12.7$  micromol/l) as compared to those with low MMA% ( $< 9.9\%$ ) and low homocysteine levels ( $< 12.7$  micromol/l). Elevated homocysteinemia may exacerbate the formation of atherosclerosis related to arsenic exposure in individuals with high levels of MMA% in urine.