

ARSENIC EXPOSURE AND BLOOD INFLAMMATORY MARKERS OF CARDIOVASCULAR DISEASE

Yu Chen, New York University School of Medicine, USA

Muhammad Kibriya, Farzana Jasmine, University of Chicago, USA

Mengling Liu, New York University School of Medicine, USA

Vesna Slavkovich, Columbia University, USA

Tariqul Islam, Columbia University and University of Chicago Research Office in Bangladesh, Bangladesh

Faruque Parvez, Columbia University

Habibul Ahsan, University of Chicago, USA

Background: Arsenic exposure from drinking water has been related to elevated risks of an array of cardiovascular disease, including hypertension, ischemic heart disease, and carotid atherosclerosis. Although mechanistic studies have suggested that arsenic promotes inflammatory activity and lead to endothelial dysfunction, epidemiologic studies that evaluate the associations of arsenic exposure with biomarkers for inflammation and endothelial dysfunction relevant to CVD are needed.

Methods: We assessed the relationship between arsenic exposure, measured in both well water samples and urinary samples, and an arrays of makers for inflammation and endothelial dysfunction, including tumor necrosis factor- α (TNF- α), interleukin-6 (IL-6), soluble intracellular adhesion molecule-1 (sICAM-1), and soluble vascular cell adhesion molecule-1 (sVCAM-1), in serum samples collected from 669 participants aged 30 and above randomly selected from the Health Effects of Arsenic Longitudinal Study (HEALS), a population-based study in Arahazar, Bangladesh. Serum levels of markers were analyzed using xMap™ technology, with commercially available high-sensitivity kits from Linco/Millipore Research. Linear regression was conducted to evaluate association between arsenic exposure and each of the markers.

Results/Conclusions: Ongoing data analyses suggest that arsenic exposure is positively related to levels of several markers for oxidative stress and inflammation relevant to CVD. This is the first large study on arsenic exposure and markers of vascular inflammation and endothelial dysfunction in cardiovascular disease (CVD), and the findings may suggest possible mechanisms by which arsenic may lead to CVD.

References:

Chen Y, Graziano JH, Parvez F, Liu M, Slavkovich V, Kalra T, Argos M, Islam T, Ahmed A, Rakibuz-Zaman M, Hasan R, Levy D, van Geen L, and Ahsan H. Arsenic Exposure from Drinking Water and Cardiovascular Disease Mortality: A Prospective Cohort Study in Bangladesh. *BMJ*. 2011. In press.

Ahsan H, Chen Y, Parvez F, Hussain AZMI, Momotai H, van Geen A, Howe GR, Graziano J. Health Effects of Arsenic Longitudinal Study (HEALS): Description of a Multidisciplinary Epidemiologic Investigation. *Journal of Exposure Science and Environmental Epidemiology*. 2006; 16:191-205.

Chen Y, Santella RM, Kibriya MG, Wang Q, Kappil M, Slavkovich V, Graziano JH, Verret WJ, and Ahsan H. Association between Arsenic Exposure from Drinking Water and Plasma Levels of Soluble Intercellular Adhesion Molecules. *Environmental Health Perspective*. 2007; 115(10):1415-20.