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ASSOCIATION BETWEEN ARSENIC EXPOSURE FROM DRINKING WATER AND PREMALIGNANT SKIN LESIONS IN BANGLADESH

Yu Chen[1], Habibul Ahsan[1], Faruque Parvez[1,2], AZM Iftikhar Hussain[3], Hassina Momotaj[3], Geoffrey Howe[1], Joseph Graziano[2]
[1]Department of Epidemiology, and [2]Department of Environmental Health Sciences, Mailman School of Public Health, Columbia University, NY10032; [3]National Institute of Preventive and Social Medicine, Mohakhali, Dhaka, Bangladesh

We evaluated the association between arsenic (As) exposure and premalignant skin lesions from drinking water at baseline in a large prospective cohort study in Araihazar, Bangladesh. Overall, 11,437 married men and women were recruited and had detailed physical examination with special emphasis on As related signs and symptoms. As-induced skin lesions including melanosis, leucomelanosis, and/or keratosis were diagnosed in 713 subjects. As exposure was measured for each cohort participant with water As concentration of primary well, total urinary As concentration, and a cumulative As index developed based on water consumption and well use history. Logistic and Possion regression were conducted to calculate prevalence odds ratios and rate ratios of skin lesions, respectively, by levels of As exposure with control of potential confounders. A consistent dose-response relationship between As exposure and skin lesion risk was observed with all exposure measures. Compared to those with <6 μg/l well As concentration, adjusted prevalence odds ratios of skin lesions for subjects with 6-38, 39-91, 92-178, and 179-864 μg/l were 2.2 (95% CI,1.5-3.2), 3.2 (95% CI, 2.2-4.5), 3.6 (95% CI, 2.5-5.2), and 6.0 (95% CI, 4.2-8.4), respectively, among those whose majority of daily water consumption was from their primary well. Patterns of effect estimates did not change appreciably by different statistical modeling and adjustment for additional variables. Urinary As and cumulative As index appeared to be a better measure of long-term, continuing As exposure and skin lesion risk, compared to well As in the study population. High levels of urinary As and cumulative As exposure were more strongly associated with advanced stage than with early stage of skin lesions. Both chronic low dose (<50 μg/l) and high dose As exposure were associated with increased risk of skin lesion in this population. As most of As-induced skin cancers would arise from these skin lesions, strategies for reducing further exposure and preventing risk of As-induced cancers are urgently needed in Bangladesh.