Environmental Arsenic Exposure in Bangladesh: Water Versus Extra-Water Intake of Arsenic

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Evaluation of the dose-response relationship for chronic arsenic poisoning in the human population living in an arsenic-contaminated area requires estimation of the exposure/intake of arsenic from the environment. The urinary excretion of arsenic can be and has been used as the dose index for individuals in our rural Bangladesh survey as well as in other preceding studies. In our survey, it was observed that even the subjects using tubewells containing very low concentrations of water excreted significant amounts of arsenic in their urine. Since the subjects of our survey heavily depended on rice in terms of energy intake, they consumed a substantial amount of rice, which might provide an amount of arsenic that cannot be overlooked. The results of our food survey and arsenic analyses favored this possibility, although this needs to be confirmed with a larger sample size. It was also shown that cooking rice with arsenic-contaminated water can result in chelation of the arsenic in the water by the rice, which poses an additional burden of arsenic to the local inhabitants.