

Arsenic Contamination in Groundwater and Foods and Its Psychosocial Effects on Rural Bangladeshi Children

著者	Mst. Nasrin Nahar
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氏 名	Mst. Nasrin Nahar
題 目	Arsenic Contamination in Groundwater and Foods and Its Psychosocial Effects on Rural Bangladeshi Children (バングラデシュ農村部における地下水・食物の砒素汚染とそれが子供に及ぼす心理社会的影響)
<p>Exposure to arsenic through drinking water sourced from groundwater is a global public health problem, which is particularly devastating in Bangladesh. Chronic exposure to arsenic (over 10 years) is reported to cause specific skin lesions such as melanosis, keratosis, or gangrene as well as non-specific health problems like hypertension, anemia, and even affect the peripheral and central nervous system. Besides these health effects, arsenic patients in Bangladesh suffer not only from economic burden of medical costs but also from psychological suppression and social discrimination, therefore, it is necessary to pay special attention to the children because they are still growing and developing mentally and socially, and thus they may show possible chronic effects. Very few studies have been conducted on As exposure and children's psycho-social development like intellectual function, e.g., IQ (Intelligence Quotient) and social competence (SC).</p> <p>The present study aimed to clarify the effect of As exposure on IQ and SC of 720 children from Sonargong thana located approximately 40 km southeast of Dhaka. The study subjects were divided into three age groups i.e. 4-5 years, 9-10 years and 14-15 years to ① evaluate the relationship between As exposure (urinary As concentration) and IQ as well as SC and to ② evaluate at what developmental stage the effect of As starts. Thereafter, in order to evaluate the contribution of sources other than drinking water to As exposure, ③ the amount of water used during cooking of the most frequently consumed food according to the FFQ (rice) was measured. IQ was assessed by Raven's standard progressive matrices (9 & 10 year and 14 & 15 year groups) and Kaufman Brief Intelligence Test (4 & 5 year group), and for measuring SC, the Bengali version of Texas Social Behavior Inventory (TSBI) Form-A was employed (over 9 & 10 year groups) . In addition, the As concentration in the staple food, rice, was also measured.</p> <p>From the findings, ① As exposure was higher in children from low income families, even after controlling for factors like household income and parental education level, As exposure was negatively correlated with IQ in all three age groups. ② Regarding IQ, the effect of As exposure was seen from 4 years old ③ The FFQ survey results revealed that rice was consumed the most frequently (more than once daily), followed by daal (bean) soup and finally non-leafy vegetables (almost once a day), but fish, meat and eggs were consumed approximately once a week. Water intake per meal from cooked rice was estimated to be 629 ml/person, followed by daal soup (278 ml/person), and cooked vegetables (88 ml/person). Our results suggest that the water used for cooking might be an important source of As.</p> <p>In conclusion, even though the children from low income families know that their tubewells are contaminated with high levels of As, they are in no position to use alternative methods like changing tubewells or buying filters so they continue consuming As contaminated water. This could be one of the reasons as to why the psycho-social effects of As exposure start from early developmental stages. In order to minimize the aforementioned effects of As exposure, there is need for urgent interventions.</p>	