Arsenic-Contaminated Water and Extent of Acute Childhood Malnutrition (Wasting) in Rural Bangladesh

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To investigate whether children’s nutritional status, especially the extent of wasting [acute malnutrition as measured by weight-for-height Z (WHZ) score] is associated with arsenic contamination of drinking water, a survey was carried out in two discrete rural areas located less than 30 km southeast and northeast of Dhaka, the capital of Bangladesh. 761 children between 7 and 14 years of age were randomly selected, one child per household. The arsenic concentration in the tube well water used by each child and the prevalence and intensity of infection of three geo-helminths [Ascaris lumbricoides, Trichuris trichiura and hookworm (Ancylostoma duodenale or Necator americanus)] were determined. Each child had their height and weight measured and WHZ score determined using the World Health Organization (WHO) reference values. Basic socio-demographic data and knowledge of arsenic poisoning were collected using a questionnaire. 62.2% of the households studied were using well water with arsenic concentrations above the 0.01 mg/L WHO guideline (i.e. arsenic-contaminated households). The mean WHZ score of all the 761 children was –0.843 (sd 1.227) but children living in contaminated households were significantly more wasted than children living in noncontaminated households (mean difference = –0.361, \( p < 0.001 \)). When the effects of the differences in socio-economic status and prevalence of geo-helminths were also taken into account, the difference in means remained highly significant (–0.330, \( p = 0.006 \)). This study suggests that arsenic contamination has a negative impact on children’s acute nutritional status.

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