Review Article

Effect of Drinking Arsenic Contaminated Water in Children

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Objective: *Chronic arsenic toxicity due to drinking of arsenic contaminated water is a major environmental health hazard throughout the world including India. Though lot of information is available on health effects due to chronic arsenic toxicity in adults, knowledge of such effect on children is scanty. A review of available literature has been made to highlight the problem in children.* ***Review Methods:*** *Scientific publication in journals, monograph, thesis and proceedings of conferences on arsenic in regard to epidemiological, clinical and psychometric studies were reviewed.* ***Results:*** *Skin abnormalities including pigmentation change and keratosis are the diagnostic signs of chronic arsenic toxicity in adults. Incidence of skin manifestations vary between 1.9-37.1% in various arsenic exposed children populations in different regions of the world. Occurrence of chronic lung disease including pulmonary interstitial fibrosis was described in arsenic exposed children in Chile. Affection of intellectual function is also reported from Thailand, Bangladesh and India.* ***Conclusion:*** *Chronic arsenic toxicity due to drinking of arsenic contaminated water causes significant morbidity in children in different parts of the world.*

Key words: *Arsenicosis, Children.*

Many aquifers in various parts of the world have been found to be contaminated with arsenic. Of these the most noteworthy occurrences are in large areas of India, Bangladesh, Taiwan and Northern China. Other Asian countries affected are Lao PDR, Cambodia, Mayanmar, Pakistan, Nepal, Vietnam. Other countries having reports of significant arsenic contamination of ground water are Hungary, Mexico, USA, Chile and Argentina. In India over and above West Bengal, other states affected are Bihar, Uttar Pradesh, Jharkhand and Assam(1). There are sufficient evidence from human studies that chronic ingestion of inorganic arsenic causes cutaneous and systemic manifestations and skin, bladder and lung cancer in adults(2).

Skin abnormalities such as pigmentation changes and keratosis have long been known to be hallmark signs of chronic arsenic exposure in adults. These lesions are the most common health effect found in populations exposed to arsenic-contaminated drinking water. Pigmentation and keratoses caused by arsenic are quite distinctive. The hyperpigmentation is marked by raindrop-shaped discolored spots, diffuse dark brown spots or diffuse darkening of the skin on the limbs and trunk. Spotty depigmentation (Leucomelanosis) also occur in Arsenicosis. Simple keratosis usually appears as bilateral thickening of the palms and soles, while in nodular keratosis, small protrusions appear in the hands, feet, or the legs. Skin lesions pose an important public health problem because advanced forms of keratosis are painful, and the consequent disfigurement can lead to social isolation in the villages. In contrast to cancer which take decades to develop, these skin lesions are generally observed 5-10 years after exposure commences. Although limited epidemiological data exist, other reported clinical manifestations resulting from ingestion of arsenic-contaminated drinking water in adults include weakness, conjunctival congestion, hepato-megaly, portal hypertension, lung disease, poly-neuropathy, solid edema of limbs and anemia(2,3).

Initial report of non-malignant pulmonary effect of chronic ingestion of arsenic by drinking arsenic contaminated water was available from studies in children in Chile as early as 1970. Rosenberg conducted autopsies on five children manifesting characteristic features of chronic arsenic toxicity, including pigmentation and/or keratosis. Lung tissue was examined in four of the five children, with abnormalities found in each and two having pulmonary interstitial fibrosis with mild bronchi-ectasis(4). Arsenical skin lesions were reported in 144 school children in Antofagasta, Chile during a

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