

Chronic Arsenic Toxicity: Clinical Features, Epidemiology, and Treatment: Experience in West Bengal

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ABSTRACT

Chronic arsenic toxicity due to drinking arsenic-contaminated water has been one of the worst environmental health hazards affecting eight districts of West Bengal since the early eighties. Detailed clinical examination and investigation of 248 such patients revealed protean clinical manifestations of such toxicity. Over and above hyperpigmentation and keratosis, weakness, anaemia, burning sensation of eyes, solid swelling of legs, liver fibrosis, chronic lung disease, gangrene of toes, neuropathy, and skin cancer are some of the other manifestations. A cross-sectional survey involving 7683 participants of all ages was conducted in an arsenic-affected region between April 1995 and March 1996. Out of a population of 7683 surveyed, 3467 and 4216 people consumed water containing As below and above 0.05 mg/L, respectively. Except pain abdomen the prevalence of all other clinical manifestations tested (e.g., pigmentation, keratosis, Hepatomegaly, weakness, nausea, lung disease and neuropathy) were found to be significantly higher in As exposed people (water As > 0.05 mg/L) compared to control population (water As level < 0.05 mg/L). The prevalence of pigmentation and keratosis, hepatomegaly, chronic respiratory disease and weakness rose significantly with increasing arsenic concentrations in drinking water. The respiratory effects were most pronounced in individuals with high arsenic water concentrations who

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also had skin lesion. Therapy with chelating agent DMSA was not found to be superior to placebo effect. However, therapy with DMPS caused significant improvement of clinical condition of chronic arsenicosis patients as evidenced by significant reduction of total clinical scores from 8.90 ± 2.84 to 3.27 ± 1.73 ; $p < 0.0001$. Efficacy of specific chelation therapy for patients suffering from chronic As toxicity has further need to be fully substantiated. However, supportive treatment could help in reducing many symptoms of the patients. Treatment in hospital with good nutritious diet has been found to reduce symptom score in a subset of placebo treated patients in West Bengal during the course of DMSA and DMPS trial. People should be advised to stop drinking As contaminated water or exposure to As from any other source. The various clinical manifestations should be treated symptomatically.

Key Words: Arsenicosis; Non cirrhotic portal fibrosis; Pulmonary fibrosis; Arsenic epidemiology; Dimercapto succinic acid; Dimercapto propane succinate.

INTRODUCTION

Many aquifers in various parts of the world have been found to be contaminated with arsenic (As) at concentration above 0.05 mg/L. Of these the most noteworthy occurrences are in large areas of West Bengal (India) and Bangladesh, Taiwan, Northern China, Hungary, Mexico, many parts of the USA, Chile and Argentina.

Though chronic arsenic toxicity due to drinking of arsenic contaminated water has been reported from many countries, but reports of large number of affected people in West Bengal, India and Bangladesh are unprecedented. In West Bengal, arsenic contamination of ground water has been reported in 777 villages of eight districts. It is suspected that about 6 million people are exposed to arsenic contaminated drinking water (As level > 0.05 mg/L) in 68 blocks of those 8 districts.^[1]

A. HOSPITAL BASED STUDY

On the basis of research carried out in the Department of Medicine and Gastroenterology at Institute of Post Graduate Medical Education and Research, Kolkata, since 1984, the clinical characteristics of chronic arsenic toxicity have been delineated.

Pigmentation, keratosis and skin cancer are the clinical manifestations mostly reported earlier as the effect of chronic arsenic toxicity though occurrence of peripheral vascular disease and neuropathy were reported from a few center. On the basis of detailed clinical, laboratory and relevant investigation in the hospital on people drinking arsenic (As) contaminated water for a long time we described that chronic arsenic toxicity produces protean systemic manifestations.^[2]

