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Toxicity due to Arsenic in Gangetic-zone of Patna, India and its linkage with Cancer

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Abstract

Extensive survey for the collection of water, soil and food materials like vegetables and fish were done from different blocks of Patna. Arsenic (As) is a well known environmental toxicant, naturally found in rocks on earth crust and contaminates the ground water. Patna is a most populated district of Bihar and situated on the Gangetic-zone. It consists of nearly 23 blocks.

The present study was aimed to assess the concentration of As in drinking water and blood samples of different blocks of Patna. Drinking water samples and blood samples were collected from all 23 blocks of Patna district and three samples from the each block were used. Estimation of Arsenic was done by Arsenic kit-method which was further confirmed by Atomic Absorption Spectrometer with VGA. People those are consuming As contaminated drinking water have high risk of disease related to different organ such as skin disease, endocrine disease, nerve-related disease, hepatic disease , etc. Sodium arsenate was used as positive control and double distilled water was used as negative control. After the confirmation of high level of Arsenic from the specific zone; blood collection was also done from the same zone. Among these blocks, As concentration was found in more than 50 ppb in drinking water samples of 15 block of Patna viz. Bikram, Bihta, Maner, Dulhin bazaar, Paliganj, Athmalgola, Barh, Bakhtiyarpur, Daniyawan, Belchhi, Pandarakh, Ghoswari, Fatuha, Khusrupur and Mokama and 100 ppb of As was detected in Danapur and Naubatpur block which is 10 times higher than the WHO permissible limit. High incidence of skin, liver and breast cancer were recorded for Patna district. During the survey of these areas nodular keratosis on palm and sole were observed. The patient of the Arsenic affected areas who were treated at Mahavir Cancer hospital, most of them showed liver cancer and few of them showed Squamous cell carcinoma and breast cancer.

No Arsenic was observed in most of the healthy people but the survey data shows the specific blocks having high Arsenic accumulation in water as well as blood samples of the patient of these areas and they showed linkage with higher incidence of skin, liver and breast cancer.

Biography

Prof. Akhileshwari Nath recipient of Gold medal at B.Sc. Hons and Research work associated Gold medals, Common Wealth Exchange fellowship and other awards for her research work. She has completed her Ph.D. in 1974 from Patna University, Patna, Bihar (India) and did postdoctoral training of Electron Microscopy from Veteran's Hospital, Minneapolis, Minnesota (USA) in 1976. She retired as professor and Head Dept. of Zoology, from Patna University, Patna, Bihar (India). Presently she is Head of the Research Centre, Mahavir Cancer Institute & Research Centre (a charitable cancer hospital) Patna, Bihar (India). She has published more than 89 papers in reputed journals and completed 5 major research projects funded by Govt. of India.