ENVIRONMENTAL LEAD CONTAMINATION AND BLOOD LEAD LEVELS IN CHILDREN AND ADULTS IN KEBAN DISTRICT

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Lead is an element of risk for the environment and human health, particularly in children. Several adverse effects of lead including neurobehavioral deficits, retarded growth and anemia have been reported. In the present study, we have investigated lead levels in soil, water and sediment samples collected from an area which had been polluted by an old and closed lead plant in Keban district of Elazig, Turkey. Blood lead levels in children and adults living in this area were also examined. The Keban lead plant was established in 1952 and operated until 1983. However, its unpreserved waste has continued to contaminate the environment and the river Euphrates until now. In the beginning of our study, soil, sediment and water samples were collected and their lead content was analyzed by Inductively Coupled Plasma-Atomic Emission Spectroscopy method. Mean lead concentrations were 18,000 and 8,600 mg/kg in soil and sediment, respectively. These concentrations (the maximum being 47,400 in a soil sample) varied depending on the distance from the location of the plant. However, lead levels in river and drinking water samples were found to be <0,001mg/L. Whole blood samples were collected from 16 individuals of both sex and varying age (including children with retarded physical and mental development) into EDTA-coated tubes and lead levels were determined by Graphite Furnace Atomic Absorption Spectrometry method. Although normal levels of lead in human blood as issued by the Turkish Ministry of Health are between 0-35 ug/100 ml, these values are <10 ug/100ml for children as reported by Center for Disease Control. In our study, blood lead levels varied between 3 and 10 ug/100 ml collected from all subjects. All analyses were carried out at certified laboratories of the Refik Saydam Hygiene Center in Ankara. It is concluded that although soil and the river have been heavily contaminated by the lead plant, no correlation was found with blood lead levels of the individuals studied. However, measures should be taken by the authorities to prevent further contamination of the environment and to protect the human health in the Keban area.