

ABSTRACT

Arsenic contamination of drinking water is common in Pakistan, especially in areas where industrial pollution is its main cause. A cross-sectional survey was conducted among 50 children (8-15 years) randomly selected from three villages of district Kasur, exposed to effluent of tanneries. Determination of arsenic contamination in the drinking water and urine of children and assessment of their health status and intellectual functioning was carried out in order to determine any correlation between intake of arsenic and intellectual functioning level.

A pre-tested semi-structured questionnaire was used to collect information on children's and their parent's demographic and socio-economic characteristics. Raven Standard Progressive Matrices (RPM) was administered on children to assess intellectual functioning.

An average of 45 % of drinking water samples taken from three villages were found to have arsenic above 10 the World Health Organization (WHO) recommended permissible value of arsenic in drinking water. For control group, 28 water samples were collected from a non affected area of Lahore where arsenic concentration in drinking water was lower than 10 $\mu\text{g/L}$. Considering urinary arsenic as a biomarker of exposure to arsenic through drinking water, it was found that an average of 50 % of children of the experimental group were found to have arsenic in their urine ranging from a concentration of 0.01 to 0.01 $19\mu\text{g/L}$. The arsenic exposure group was generally more affected by diarrhoea, skin problems, vomiting and abdominal pain, as compared to the non-exposed group, the first two diseases being the most prevalent in the former case. Interestingly, average intellectual functioning in exposed population was found to be 23 with a percentile score of 14, while intellectual functioning in control group was 26 with a percentile score of 20.

Conclusively, this study showed that the intellectual functioning level of children drinking arsenic contaminated water was significantly lower as compared to those, drinking arsenic-free water.