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Health Risk Assessment of Exposure to Metals in a Nigerian Water Supply

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ABSTRACT

This article reports the health risk associated with chronic intake of metals in the municipal water supplies of Eleyele and neighboring towns in the Ibadan metropolitan area of Nigeria. A total of 42 composite samples, consisting of treated water from the water treatment facility and residential areas receiving personal-use water (*i.e.*, tap water) directly from the facility, as well as raw water from the treatment facility's water supply dam were sampled twice every month for 7 months. Concentrations of the metals were determined by atomic absorption spectrophotometry. Among the metals studied, Cd, Co, Cr, and Pb were detected at concentrations higher than maximum regulatory limits. Cd, Co, Cr, and Pb concentrations in treated water at the treatment facility ranged from 0.08–0.10, 0.14–0.16, 0.04–0.22 and 0.07–0.36 mg L⁻¹, respectively, while personal-use water ranged from 0.08–0.11, 0.15–0.29, 0.02–0.29, and 0.12–0.65 mg L⁻¹, respectively. Likewise, concentrations of the metals at the dam ranged from 0.06–0.08, 0.17–0.20, 0.13–0.37, and 0.03–0.15 mg L⁻¹, respectively. It is estimated that exposure to the metals in the water supply results in oncological and non-oncological systemic health risks higher than is generally acceptable for drinking water.

Key Words: systemic, chronic, oncological, carcinogenic, hazard quotient

