

## **Study Of Uranium Toxicity In Humans Due To Protracted Ingestion Of Groundwater In Bathinda District Of Punjab, India**

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Monitoring of uranium content in groundwater of radiologically active areas is a vital step for establishing baseline of environment protection. In this regard, 64 groundwater samples collected post-monsoon from handpumps or dug wells in Bathinda district of Punjab were analysed by LED fluorimeter for analysis of uranium concentration and associated health risks. Uranium content varied from 5.19 to 579.28  $\mu\text{g L}^{-1}$ , with an average value of 106.41. 82% samples surpassed the limit of  $30\mu\text{g L}^{-1}$  mandated by WHO(2011) while 46% groundwater samples exceeded the limit of  $60\mu\text{g L}^{-1}$  set by AERB(2004). Radiological and chemical toxicity was also measured for different isotopes of uranium. The calculated average mortality and morbidity risks were lower than the actual prescribed limit. The average Lifetime Average Daily Dose (LADD) was calculated as 2.13, resulting in Hazard Quotient (HQ) above unity. Thus, the groundwater is not safe for drinking water consumption by members of the public in some areas. Using Hair Compartment Model for uranium, organ specific doses due to uranium radioisotopes in prime organs/tissues and excretion rates via urine, faeces and hair pathway are estimated.

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