EPR dosimetry study for population residing in the vicinity of fallout path of nuclear test in August 7, 1962

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Study Goal: In the period from 1949 to 1962, 125 nuclear tests (including 25 near-surface nuclear tests) were conducted at the Ground Zero technical site in the Semipalatinsk Nuclear Test Site (SNTS). The method of electron paramagnetic resonance (EPR) dosimetry has been applied to human tooth enamel to obtain individual absorbed doses of residents of settlements in vicinity of the central axis of radioactive fallout paths from the contaminating surface nuclear test in August 7, 1962.

Abstract: A tooth enamel EPR dosimetry study was carried out with the purpose of obtaining the individual absorbed radiation doses of populations from settlements in the Semipalatinsk region of Kazakhstan, which was exposed to radioactive fallout traces from nuclear explosions in the Semipalatinsk Nuclear Test Site. Most of settlements (Kurchatov, Akzhar, Semenovka, Begen, Mayskoe) are located from 70 to 100 km to the North from the epicenter of explosion at the Semipalatinsk Nuclear Test Site (SNTS). A dose of $56 \pm 42$ mGy was found in residents of Kurchatov city located close to the path of the fallout. This region is basically an agricultural region. It was found that the excess doses obtained after subtraction of natural background radiation ranged up to about 100 mGy all for residents in this region. In total, about 50 teeth samples were collected. The Kokpekty settlement was chosen as a control because it was not subjected to any radioactive contamination, being located 400 km to the Southeast from SNTS.

Conclusion: The dosimetry investigation of Kurchatov city residents provides useful data but needs additional study, owing to an insufficient number of samples.

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