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Study of Po-210 content in the urine of people living in the homes with high radon concentrations

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The objective of the presented research is to find a possible effect of living and/or working in places where the radon concentration exceeds the Czech guideline (reference) level of 300 Bq/m³. The first step was to determine ²¹⁰Po concentration in urine samples from such people. Twenty-nine non-smokers volunteered to provide a urine sample excreted within 24 hours. They were asked to not consume fish, seafood, liver and kidney one week before and during the urine collection. These factors influence the intake of ²¹⁰Po, and therefore its excretion in urine, as it was shown in the review paper by Hölgýe and Straková (2009).

The values of ²¹⁰Po concentration found in urine samples were in the range of 3.1 - 28.8 mBq/day. The arithmetic mean (AM) was calculated at 7.64 ± 5.78 mBq/day and a geometric mean (GM) was 6.4 mBq. On the other hand, people who have not been exposed to high radon concentrations had a range of 1.4 - 10.8 mBq/day of daily excretion of ²¹⁰Po, AM 4.1 ± 2.0 mBq/day and GM 3.7 mBq/day, as was found by Hölgýe (2013) in a group of 40 Prague citizens. Based on these results, it can be suggested that the individuals staying in an environment with increased radon activity concentration excrete more ²¹⁰Po in the urine.

Knowledge of ²²²Rn activity concentrations in homes of the volunteers alone is not adequate to determine the possible impact of radon content in houses on ²¹⁰Po excretion. To evaluate this effect, additional data about the environment in which the people under investigation are living and/or working and the habits of these people (ventilation, outdoor stay, etc.) will be obtained and used in this study.

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