Lung cancer and bronchi-pulmonary diseases of iron uranium miners

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Body of Abstract: The lung cancer mortality has been analyzed for 2,582 miners employed from 1943 to 1961. All persons observed had three years occupation at least. Basing upon the lung cancer risk value per unit of the exposure, the assessment of the effective standard of pulmonary organ irradiation to radon progeny was elaborated and mortality excess was calculated. Medical demography studies of morbidity and mortality were elaborated for silicosis, silicotuberculosis, lung cancer and occupational bronchitis versus the magnitude of dust and radiation exposure. Annual and cumulative exposures have been assessed for seven cohorts of miners employed and vast primary material has been accumulated for the period of 40 years (1943 – 1984). Intensive indices of mortality were determined for observation periods. The mortality excess was compared to cumulated radiation exposure. The lung cancer mortality excess in iron-uranium miners was 3.3 cases per 106 man-years per 1 WLM; 4.8 cases per 106 man-years per 1 WLM was assessed if first 10 years of occupation are neglected. The latent period from radiation exposure to death from lung cancer is generally ten year or more.

Changes of miners labor conditions (the magnitude of dust exposure) have been reflected by the bronchi pulmonary disease structure. The input of these diseases into the occupational lung pathology has been significantly changed with the time course. Within first 18 – 20 years, pneumoconiosis was the only form of occupational lung pathology in the mine, whereas occupational bronchitis and lung cancers were recorded within next ten years thereafter. In cohorts of longest observation period, the average age of patients was increasingly ranked versus diseases as follows: silicosis, silicotuberculosis, chronic bronchitis, and lung cancer.