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A preliminary study on the risk of lung cancer from radon exposure in Chinese uranium miners based on Poisson regression

Since the 1980s, scholars from various countries have begun to study relative risk of lung cancer caused by radon. The research results show that radon exposure can increase the risk of lung cancer in underground miners. However, due to the limitations of research cohort and calculation software, the excess relative risk coefficient of radiation-induced cancer in China has not been obtained. To obtain and verify the excess relative risk coefficient of radon induced lung cancer in China, this study uses the data of Chinese uranium mines to preliminarily estimate the excess relative risk coefficient of radon induced lung cancer.

In this study, 4851 male miners who worked in a uranium mine in Hunan, China for more than one year from 1958 to 1985 were selected as subjects, and a total of 207251 person years were followed up. Poisson regression was used to fit the risk of lung cancer death caused by radon with time since exposure, attained age and exposure rate.

The results showed that when the average time since exposure was 45 years and the average exposure rate was 0.14wI, the estimated value of excess relative risk coefficient ERR/ 100WLM was 1.73 (95% CI: 0.36; 3.11). For every 10 years since exposure, the relative risk decreased by about 60%, and for every 1wI increase in exposure rate, the relative risk increased by about 30%.

The preliminary estimation of the risk coefficient of lung cancer caused by radon in Chinese uranium miners can provide a scientific basis for the calculation of carcinogenic risk and etiological probability of radon exposure in China's occupational population.

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