

CANCER OCCURRENCE AMONG RADIATION WORKERS AT JASLOVSKÉ BOHUNICE NUCLEAR POWER PLANT

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SUMMARY

The Public Health Institute in Trnava, Slovak Republic under coordination of the International Agency of Cancer Research (IARC) at Lyon, France, had completed a retrospective cohort study of cancer occurrence among nuclear workers at Jaslovské Bohunice, Slovak Republic, as part of a multicentric cohort study of 14 countries.

The objective of the study was to assess an impact of a long-term low level ionising radiation on cancer occurrence. In summary, 2776 employees had been selected for the follow-up period, which lasted since January 1, 1973 till December 31, 1993, it means for 21 years. Mean age at beginning of follow-up was 28.9 years and at the end of follow-up 39.6 years. The total number of person years was 27 742.1 of males and 2 442.2 of females. Exposure was expressed as annual cumulative dose of each cohort member. The total cumulative external gamma dose over the follow-up time was 58 187.9 mSv. The average external gamma dose per person years was 2.06 mSv of males and 0.37 of females. Socio-economic status, described by the last job description and education were used as possible confounding variables.

All cause mortality, cancer caused mortality and cancer incidence were assessed comparing with general Slovak population using indirect standardised mortality ratio or incidence ratio calculations. There were 47 deaths reported, 44 males and 3 females, over 21 years of follow-up. The most frequent causes of death were cancer (about 30%), accidents, suicides and other external causes (about 26%), cardiovascular diseases (23%). Standardised mortality ratios of 0.39 (0.386-0.392) and 0.46 (0.27-0.59) for males and females, respectively were found in case of all cause mortality. In case of cancer mortality the standardised mortality ratios (SMR) were 0.44 (0.42-0.47) and 1.35 (0.84-1.86) for males and females, respectively. There were 32 incident cases of cancer observed during follow-up. Standardised incidence ratios as 0.508 (0.49-0.52) and 0.905 (0.74-1.06) for males and females, respectively were found. Dose response relation was measured using Poisson regression and Cox proportional hazard model. The estimated excess risks in both approaches and both for mortality and morbidity study were rather anecdotal due to lack of statistical significance caused by small number of cases.

Key words: radiation, nuclear workers, cohort study, mortality, morbidity, dose-response

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