Studies of Cancer Risk Among Chernobyl Liquidators: Materials and Methods

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ABSTRACT

The current paper presents the methods and design of two case-control studies among Chernobyl liquidators - one of leukaemia and non-Hodgkin lymphoma, the other of thyroid cancer risk - carried out in Belarus, Estonia, Latvia, Lithuania and Russia. The specific objective of these studies is to estimate the radiation induced risk of these diseases among liquidators of the Chernobyl accident, and, in particular, to study the effect of exposure protraction and radiation type on the risk of radiation induced cancer in the low-to-medium-(0-500 mSv) radiation dose range.

The study population consists of the approximately 10 000 Baltic, 40 000 Belarus and 51 000 Russian liquidators who worked in the 30 km zone in 1986-1987, and who were registered in the Chernobyl registry of these countries. The studies included cases diagnosed in 1993-1998 for all countries but Belarus, where the study period was extended until 2000. Four controls were selected in each country from the national cohort for each case, matched on age, gender and region of residence. Information on study subjects was obtained through face-to-face interview using a standardised questionnaire with questions on demographic factors, time, place and conditions of work as a liquidator and potential risk and confounding factors for the tumors of interest.

Overall, 136 cases and 595 controls after receiving their consent were included in the studies. A method of analytical dose reconstruction has been developed, validated and applied to the estimation of doses and related uncertainties for all the subjects in the study. Dose-response analyses are underway and results are likely to have important implications to assess the adequacy of existing protection standards, which are based on risk estimates derived from analyses of the mortality of atomic bomb survivors and other high dose studies.

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