Adjustment for Smoking Reduces Radiation Risk

Fifth Analysis of Mortality of Nuclear Industry Workers in Japan, 1999–2010

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Abstract

Many cohort studies among nuclear industry workers have been carried out to determine the possible health effects of low-level radiation. In those studies, confounding factors, for example, age was adjusted to exclude the effect of difference of mortality by age to estimate radiation risk. But there are few studies adjusting for smoking that is known as a strong factor which affects mortality.

Radiation Effects Association (REA) initiated a cohort study of nuclear industry worker's mortality in 1990. To examine non-radiation factors confounding on the mortality risk among the radiation workers, REA have performed life-style questionnaire surveys among the part of workers at 1997 and 2003 and found the correlation between radiation dose and smoking rate. Mortality follow-up were made on 75,442 male respondents for an average of 8.3 years during the observation period 1999-2010. Estimates of Excess Relative Risk percent (ERR%) per 10mSv were obtained by using the Poisson regression. The ERR for all causes was statistically significant (1.05 (90%CI 0.31 : 1.80)), but no longer significant after adjusting for smoking (0.45 (-0.24 : 1.13)). The ERR for all cancers excluding leukemia was not significant (0.92 (-0.30 : 2.16)), but after adjusting for smoking, it decreased (0.36 (-0.79 : 1.50)).

Thus smoking has a large effect to obscure a radiation risk, so adjustment for smoking is important to estimate radiation risk.

keywords : cohort study, cancer, confounding factor