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## **Confounding between the cumulative dose and a hazardous job history among Japanese nuclear workers (J-EPISODE)**

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### **Background**

The Japanese Epidemiological Study on Low-Dose Radiation Effects (J-EPISODE) has been carried out to investigate health effects of low-dose radiation among nuclear workers since 1990. The study identified lifestyle factors and socio-economic status as confounders. In the study, excess relative risks (ERRs) were reduced by adjusting confounding factors, such as smoking. To estimate ERRs precisely, further studies of other potential confounding factors are needed.

### **Aim**

To explore the potential role of a hazardous job history, such as exposure to asbestos, a carcinogen, as a confounder of the cumulative dose among Japanese nuclear workers.

### **Materials and methods**

The study population comprised Japanese nuclear workers employed in the industry until the end of March 1999. A lifestyle questionnaire was distributed to a part of workers in 1997 and 2003. A hazardous job history included exposure to asbestos, powder dust, chrome, nickel, arsenic, organic solvents, benzene, aromatic amines, coke ovens, and coal tar were inquired. The radiation dose was supplied by the Radiation Dose Registry Center of the Radiation Effects Association. The cumulative dose was based on exposure data recorded between 1957 and 2010.

### **Results**

The number of cohort was 75,442 who responded to the questionnaire survey. The arithmetic mean cumulative dose was 25.8 mSv. Positive associations were found between the cumulative dose and a job history of exposure to asbestos, powder dust, and arsenic. These results suggest that a hazardous job history should be taken into account when estimating radiation exposure risks.

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**Background:** Confounding to smoke was found in the Japanese Epidemiological Study on Low-Dose Radiation Effects (J-EPISODE) which have been carried out since 1990. To estimate radiation effects precisely, further studies of other potential confounding factors are needed.

**Aim:** To explore the confounding between cumulative dose\* and hazardous job history among Japanese nuclear worker. (\* 1957-2010, supplied by Radiation Dose Registry Center.)

## Cohort definition:

- Male worker who have Japanese nationality.
- Employed until the end of March, 1999.
- Replier of self-administered lifestyle questionnaire survey (1997 and/or 2003).

## Results:

- N=75442, mean cumulative dose=25.8 mSv.
- **Positive confounding between cumulative dose and asbestos, powder dust.**
- Positive confounding to arsenic, but the number of job history was small.
- Negative confounding to benzene and aromatic amines, but the numbers of job history were small.

Table. The number & proportion of workers who have job history.

Job	Asbestos	Powder dust	Chrome	Nickel	Arsenic	Organic solvents	Benzene	Aromatic amines	Coke ovens	Coal tar
Number	2323	6199	315	219	284	5609	377	147	311	655
Proportion	3.1%	8.2%	0.4%	0.3%	0.4%	7.4%	0.5%	0.2%	0.4%	0.9%

Figure. Cumulative dose & proportion of the worker who have job history by age at questionnaire survey groups. (P means P-value for age-adjusted trend test.)

