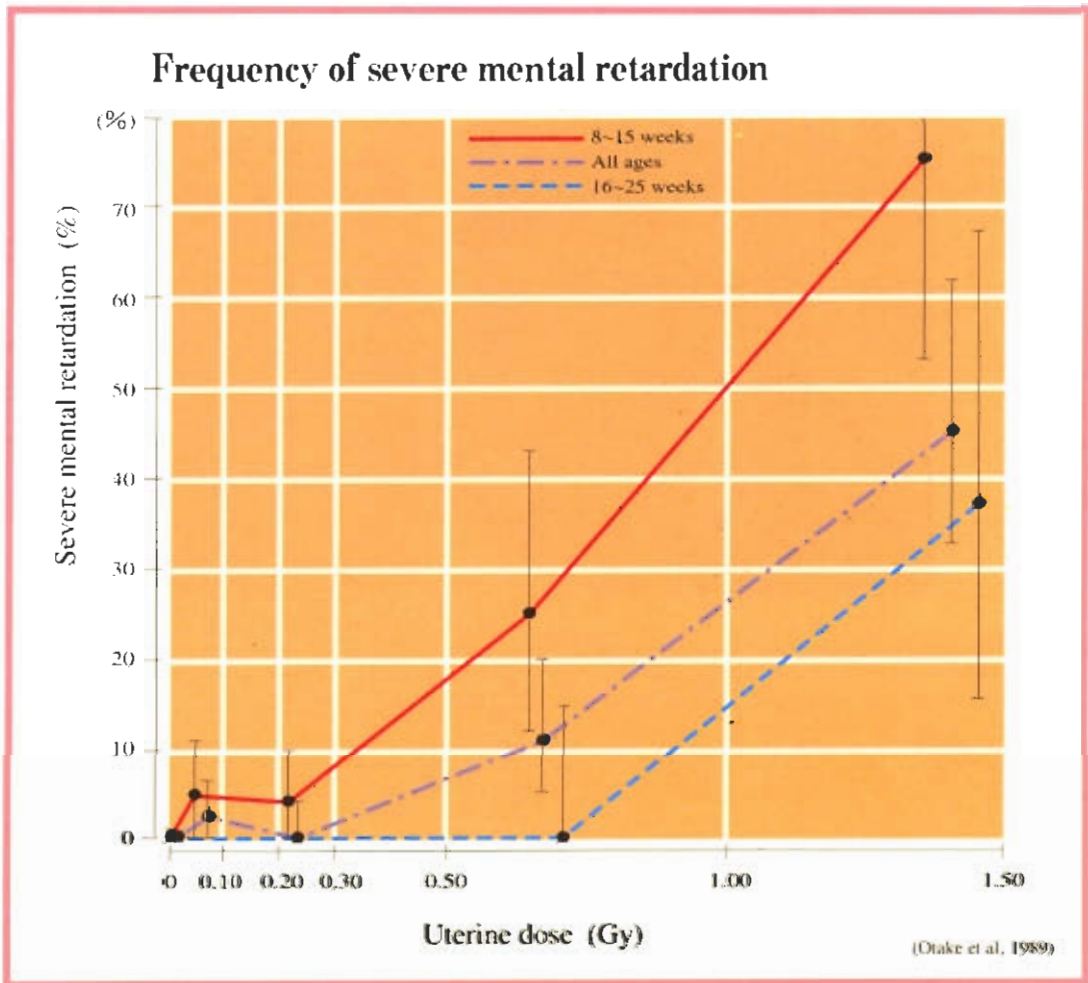


6

Prenatal exposure



1. Frequency of severe mental retardation

Approximately 1,100 people are thought to have been prenatally exposed within 2 km of the hypocenter.

The fetal brain is relatively sensitive to radiation. A relationship between atomic bomb radiation and both mental retardation and microcephaly has been apparent since the mid-1950's. The frequency of severe mental

retardation was dose-dependent for survivors prenatally exposed at a gestational age of either 8 - 15 or 16 - 25 weeks, with the tendency especially marked in the former group. The frequency of microcephaly, in which head circumferences are more than two standard deviations smaller than the mean head size of the general population, also showed a radiation effect.

| Cancer risk in prenatally exposed survivors | Prenatally exposed survivors Cancer incidence (1950~1984) | | Survivors exposed while young Fatal cancers (1950~1985) | |
|--|--|-------|--|--------|
| | Maternal uterine dose (Gy) 0 | ≥0.01 | Kerma dose* (Gy) 0 | ≥0.01 |
| Number of subjects | 710 | 920 | 6,901 | 8,994 |
| Number of cancer patients | 5(0) | 13(2) | 49(7) | 93(24) |
| Relative risk at 1 Gy | Cancer (all sites) | 3.77 | Leukemia | 17.1 |
| | | | Other cancer (all sites) | 2.35 |
| Excess absolute risk | Cancer (all sites) | 6.57 | Leukemia | 2.93 |
| | | | Other cancer (all sites) | 2.29 |

[* Figures in parentheses indicate number of leukemia cases. Excess absolute risk is per 10^4 person · years · Gy.]* "kerma" is an acronym for kinetic energy released in materials and is the energy imparted per unit mass in a small sample of tissue] (Yoshimoto, 1988)

2. Cancer risk in prenatally exposed survivors

Compared to the controls (0 Gy), the mortality rates up to 1984 for prenatally exposed survivors with a maternal uterine dose of ≥ 0.60 Gy were high for infants and those aged 15 - 39.

A 1950 - 1984 cancer incidence study found

13 cancer cases in the ≥ 0.01 Gy population and 5 in the controls, thus demonstrating an increased cancer incidence due to atomic bomb radiation. No difference was found with respect to trimester of pregnancy.

Consideration of relative risk etc. suggests that the cancer risk due to prenatal radiation exposure is roughly of the same order as the risk due to exposure while under 10 years of age.